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POTENTIAL EFFECTS ON ENERGY INDUSTRIES OF THE
PROPOSED WATER-QUALITY STANDARDS REGULATION

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PROPOSED WATER-QUALITY STANDARDS REGULATION

by

Michael J. Davis

Energy and Environmental Systems Division
Integrated Assessments and Policy Evaluation Group

April 1983

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CONTENTS

EXECUTIVE SUMMARY.....	v
1 INTRODUCTION.....	1
2 ANALYSIS OF THE PROPOSED REGULATION.....	2
2.1 Nature of the Proposed Regulation.....	2
2.1.1 Major Features.....	2
2.1.2 Requirements.....	4
2.1.3 Changes from the Existing Regulation.....	5
2.2 Significance of the Proposed Regulation.....	5
3 POTENTIAL INFLUENCE OF THE PROPOSED REGULATION ON ENERGY INDUSTRIES...	8
3.1 Methodology.....	8
3.2 Assessment of Potential Effects.....	12
3.2.1 Federal Region IV.....	13
3.2.2 Federal Region V.....	19
3.2.3 Federal Region VI.....	22
3.2.4 Federal Region VIII.....	23
3.2.5 Federal Region IX.....	26
3.3 Case Study.....	26
3.4 Discussion.....	29
4 CONCLUSIONS.....	34
REFERENCES.....	36
ACKNOWLEDGMENTS.....	39
APPENDIX A: PROPOSED WATER-QUALITY STANDARDS REGULATION.....	40
APPENDIX B: CURRENT WATER-QUALITY STANDARDS REGULATION.....	47
APPENDIX C: LIST OF FACILITIES.....	52

TABLES

3.1 Probable Effects of the Proposed Regulation on Permits.....	10
3.2 Conditions in Florida.....	14
3.3 Conditions in Kentucky.....	16
3.4 Conditions in Mississippi.....	17
3.5 Conditions in North Carolina.....	18
3.6 Conditions in Tennessee.....	19

TABLES (Cont'd)

3.7	Conditions in Illinois.....	20
3.8	Conditions in Wisconsin.....	21
3.9	Conditions in Colorado.....	24
3.10	Conditions in South Dakota.....	25
3.11	Stream Segments and Uses on Whitewood Creek, South Dakota.....	30
3.12	Occurrence of Facilities in Priority Areas.....	31
3.13	Effect of Adoption of the Proposed Regulation on Energy Facilities: Opinions of State Officials.....	32
3.14	Effect of Adoption of the Proposed Regulation on Energy Facilities: Assessment Based on This Study.....	33
C.1	Facilities with Water-Quality-Based Limitations.....	52

FIGURES

3.1	Locations of Energy Facilities Identified with Discharge Permits Containing Water-Quality-Based Limitations or Whose Operations Have Been Influenced by Water Quality Concerns.....	11
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EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) has proposed revisions to the existing water-quality standards regulation that provide increased flexibility to the states in focusing on priority water bodies, in establishing site-specific water quality criteria, in judging use attainability (including the use of a benefit-cost assessment), and in changing designated uses. The proposed changes also provide an explicit opportunity to define subcategories of aquatic use (e.g., warm-water and cold-water fisheries) and eliminate the existing provision for protection of outstanding national resource waters. Finally, the proposed regulation would allow changes to occur in the quality (not use) of high-quality waters without a requirement for public participation. Overall, the focus is on providing more flexibility to the states, on encouraging a more cost-effective approach by stressing problem areas, and on emphasizing beneficial uses rather than individual water-quality parameters.

Although the potential exists for some influence on the permits of facilities in the steam-electric, coal-mining, and petroleum-refining industries if the proposed water-quality standards regulation is adopted in its present form, the results of this study indicate that most such effects are likely to be minor. There will probably be no major changes in the programs of most states if the proposed regulation is adopted, although states may give more attention to priority areas. The proposed regulation provides the states with more flexibility in revising water quality standards. However, pressure for changes in standards would often come not from the states, but from dischargers seeking relief from existing permit conditions that are based on water quality standards. Therefore, although there could exist the potential for changes in permits in the direction of either more or less stringency, changes would often tend to involve less-stringent limits because pressures for such changes would tend to be strongest. Existing energy facilities that are located on priority water bodies and that have water-quality-based conditions in their permits are the most likely to be influenced. Although there is no reason to believe that the permits of many such facilities would be affected, attention would often tend to be focused on such permits either as the result of efforts made by the operators of the facilities or by other dischargers on the same body of water. The likely effect of the proposed regulation on the siting of new facilities is widely viewed as being negligible.

The potential for effects on energy facilities was examined in this study using two approaches. First, opinions were obtained from a number of officials in state regulatory agencies and in regional offices of the EPA. The most common opinion was that there would be little effect on energy facilities if the proposed regulation was adopted in its present form. However, a significant number of officials expressed some uncertainty about the possible outcome. Second, the potential for effects was assessed in a number of states

in a more quantitative manner by determining the frequency with which energy facilities, especially those with water-quality-based permit conditions, are sited on water bodies that are considered, or are likely to be considered, state priority areas. The vast majority of the energy facilities that have been identified with water-quality-based permit limitations are located in the states examined. The analysis showed only a limited number of facilities located on priority receiving waters for which attainment of designated uses appears to be in question. In addition, the number of cases in which adoption of site-specific criteria could influence permits is small. It is in those priority areas where designated uses are not presently attained or where site-specific criteria may be set that the potential for influence of the proposed regulation on permit conditions is largest. Therefore, the conclusion of this study must be that the potential for effects on energy facilities appears to be low, unless the state officials contacted frequently misjudged the attainment of uses and the location of priority areas. This conclusion should not be generalized to other industries without further analysis because of differences in siting patterns.

The fate of the proposed water-quality standards regulation is uncertain, although it is unlikely to be promulgated in its present form. The proposed regulation has received considerable criticism, primarily from environmental groups concerned about its possible adverse effects on water quality. However, significant criticism has also come from other sources, notably many states and Congress. Some concerns expressed over the proposed regulation relate to the changes in the antidegradation provision, to the possibility of lowering water quality standards, to the encouraged use of a benefit-cost assessment, and to the possible lack of national consistency in reviews by EPA.

1 INTRODUCTION

This report examines how the water-quality standards regulation recently proposed¹ by the Environmental Protection Agency (EPA) may affect water pollution control requirements for, and the siting of, energy-sector facilities. EPA is revising the existing water-quality standards regulation² to provide increased flexibility to the states in focusing on priority water bodies, in establishing site-specific water-quality criteria, in judging use attainability, and in changing designated uses. The proposed changes also provide an explicit opportunity to define subcategories of aquatic use (e.g., warm-water and cold-water fisheries) and eliminate the existing provision for protection of outstanding national resource waters. Finally, the proposed regulation would allow changes to occur in the quality (not use) of high-quality waters without a requirement for public participation. Overall, the focus is on providing more flexibility to the states, on encouraging a more cost-effective approach by stressing problem areas, and on emphasizing beneficial uses rather than individual water-quality parameters.

Since the proposed regulation will influence how water quality standards are established, it may also influence discharge permits that have water-quality-based limitations in them. In addition to influencing water-quality-based permit limits, the proposed regulation could also affect the siting of new facilities on high-quality waters. Although the existing regulation, which requires public participation prior to lowering the quality of high-quality waters, has the potential for influencing siting of new facilities in areas having high water quality, it is not clear that any constraints on development have occurred. (In the announcement of the proposed regulation,¹ EPA requested information on any cases in which the existing policy may have constrained growth or development.) Nevertheless, by eliminating public participation requirements before lowering the quality of high-quality waters, it is possible that the siting on such waters of new facilities, including those in energy industries, might be facilitated or even encouraged.

This report is organized into four sections and three appendixes. Following this introduction, the proposed regulation is described and analyzed in a qualitative manner in Sec. 2. Section 3 presents a quantitative assessment of the potential for effects on energy industries. Steam-electric power generation, petroleum refining, and coal mining are considered. Finally, conclusions are given in Sec. 4. The three appendixes contain supporting material.

2 ANALYSIS OF THE PROPOSED REGULATION

The proposed regulation¹ is concerned with the establishment, review, revision, and approval of water quality standards as authorized under section 303(c) of the Clean Water Act. If adopted, it would be added as a new part 131 of Title 40 of the Code of Federal Regulations. It would incorporate or revise existing material from parts 35 and 120 as well as add new material.

This section provides a description and analysis of the proposed regulation. The section is divided into two parts. In the first, discussions are presented of the proposed regulation's major features, its requirements, and how it contrasts with the existing regulation. (Appendix A contains the full text of the proposed regulation along with an overview; the existing regulation is presented in Appendix B.) The second portion of this section examines the potential, general significance of the proposed regulation, as well as how it might influence energy industries.

2.1 NATURE OF THE PROPOSED REGULATION

2.1.1 Major Features

Many important features of the proposed water-quality standards regulation involve explicit options provided to the states in several areas. There is generally no reason that these options could not have been used by the states under the current regulation — in fact, most are presently used by some states. However, providing the options explicitly in a regulation will tend to encourage their use. Important options provided are the following:

- The focusing of attention on priority water bodies (§131.20).
- Providing explicitly the choice of using site-specific criteria (§131.12)³ and developing guidance material to assist in doing so.
- Encouraging the analysis of use attainability and the assessing of benefits and costs when revising designated uses (§131.10) and providing goals (§131.11) and guidance³ for such studies.
- Providing for subcategories of aquatic protection [§131.10(b)].
- Encouraging the adoption of seasonal uses rather than the reclassifying of a water body to uses requiring less stringent criteria [§131.10(g)].

The proposed regulation also provides two options related to criteria for toxic pollutants. First, states are not required to adopt criteria for toxic pollutants, although EPA encourages them to do so where it is appropriate to protect the designated use [§131.12(a)(2)]. Second, the states "may select what they believe to be an appropriate risk level for pollutants identified as carcinogens and include in their water quality standards the ambient criteria associated with the particular risk level selected" [§131.12(c)(2)]. No statements related to toxic pollutants are in the existing regulation. The two paragraphs just cited would probably have little actual effect, since they reflect current conditions in terms of state water quality standards. That is, very few criteria for toxic pollutants are found in state standards - some state standards contain no such criteria. Nevertheless, the topic of toxic pollutants is noteworthy in terms of the lack of guidance provided.

Other important features in the proposed regulation relate to topics covered by the existing regulation. The following are areas that have been changed significantly:

- Antidegradation policy. The proposed regulation requires states to have a policy that existing water uses be maintained [§131.10(c)]. The emphasis is on maintenance of uses rather than on individual water-quality parameters. The existing regulation requires that high-quality waters be maintained and protected [§35.1550(e)(2)]. Public participation is required before lower water quality is allowed. The proposed regulation does not include the public participation requirement.
- Protection of outstanding national resource waters. The present requirement [§35.1550(e)(2)] for nondegradation of such waters is dropped because the Clean Water Act does not allow for designation as national resource waters.
- Modifying or reclassifying uses. The proposed regulation provides an expanded and more explicit list of conditions under which a use may or may not be modified or reclassified [§131.10(h and i)]. Terminology is also changed; the terms "upgrading" and "downgrading" of uses are replaced by "modifying" and "adding" or "removing."
- Review of standards. States are not required to review the standards for all water bodies in every three-year cycle [§131.20(a)]. Attention to priority areas or segments is recommended. The present regulation has been interpreted as requiring a review for all water bodies every three years.

- EPA review. The proposed regulation is more explicit concerning supporting analyses prepared by the states and concerning the EPA review process.

2.1.2 Requirements

The proposed regulation is intended to allow considerable flexibility on the part of the states. There are only a limited number of mandatory requirements:

- Certain elements must be contained in each state's water quality standards, namely,
 - designated uses [§131.5(a)];
 - criteria to protect the designated uses [§131.5(c)], as well as downstream uses [131.12 (c)(3)];
 - an antidegradation policy statement [§131.5(d)].
- Submissions of water quality standards to EPA must be accompanied by methods used and analyses conducted to support standards revisions [§131.5(b)], and a certification by the State Attorney General that the standards were duly adopted pursuant to state law [§131.5(e)].
- Existing uses must be maintained unless uses requiring more stringent criteria are added [§§131.10(c) and (i)(1)].
- States must review and, as appropriate, revise their standards at least once every three years. A review for all water bodies is not required [§131.20(a)].
- Public hearings must be held by the states when reviewing water quality standards and selecting priority areas [§131.20(b)].
- The states must submit the results of their standards review and revisions and EPA must review and approve or disapprove revisions within stated time periods [§§131.20(c) and 131.21(a)].
- EPA is subject to explicit requirements when disapproving or promulgating standards [§§131.20(b) and 131.22(c)].

2.1.3 Changes from the Existing Regulation

The major changes associated with the proposed water-quality standards regulation involve its discretionary features. These are presented in Sec.

2.1.1. The only new mandatory requirements are the following:

- Submissions of water quality standards to EPA must be accompanied by methods used and analyses performed and by the State Attorney General's certification.
- Details are added related to submissions, approvals, and promulgations of standards.

The proposed regulation eliminates two features of the existing one:

- Public participation would no longer be required to lower the quality of existing high-quality waters.
- No provision would be made for outstanding national resource waters. However, states may provide their own special designations for high quality waters if desired.

2.2 SIGNIFICANCE OF THE PROPOSED REGULATION

What effects could reasonably be expected if the proposed water-quality standards regulation is adopted in its present form? Changes might occur in the quality of receiving waters, in the permits of dischargers, and in how the states and EPA operate their water-quality management programs. Since the focus of this study is on potential effects on energy industry, attention will be restricted to possible changes in industrial permits. Although the proposed regulation involves water quality standards, proposed changes have the potential to influence the permit conditions of dischargers sited on water-quality-limited water bodies — that is, bodies of water for which application of technology-based effluent standards is not adequate to avoid violation of water quality standards. Changes to either more-restrictive or less-restrictive permit conditions could occur for dischargers that already have water-quality-based conditions in their permits. There is also the potential that more-restrictive water-quality-based conditions could be placed in some permits that are now based only on technology. Permits of new facilities could be affected in similar ways. Finally, the proposed change in the anti-degradation policy could potentially influence siting of some facilities on high-quality bodies of water.

If changes to permits do occur as a consequence of the proposed regulation, they will be the result of actions at the state level related primarily to proposed options. In particular, the options related to selection of priority areas, establishment of site-specific criteria, and determination of

use attainability could have an influence on permitting. Changes may occur because attention is focused on priority water bodies, locations which are often likely to be problem areas. If examination of such priority areas shows that designated uses are not being met, then use-attainability analyses and benefit-cost assessments might be performed. In any case, site-specific criteria could be set. The consequence could be changes to criteria or uses or both. These changes could influence permit conditions for dischargers located in the priority areas.

The dropping of the requirement for public participation prior to changing the quality of high-quality waters could theoretically have an influence on the siting of new facilities in pristine areas. It is not clear that the present antidegradation policy requiring public participation has prevented the siting of many facilities; however, the proposed change could make such efforts easier. Many states will retain public participation requirements in their own antidegradation policies, so in many cases the potential for change is limited.

The question of the possible effects of the proposed regulation was discussed with officials in numerous states and in all EPA regional offices. Generally, the opinion expressed was that there seems to be little reason to expect the states to change their programs to any great extent. In most cases, there is no reason to believe that there will be any significant effect on industrial permits because of the initiative of the states in response to the proposed regulation. If changes do occur, it is likely that the impetus for change will often come from industry. In some cases it is likely that industry would use the presence of the explicit options provided in the proposed regulation as the basis for pressuring states to accord their receiving waters higher priority, for requesting or conducting use-attainability studies, or for supporting development of more-favorable site-specific criteria. Such events would likely lead to disputes over technical details, as might occur in conducting a cost-benefit assessment or developing site-specific criteria. They might also result in a significant use of a state's resources in responding to requests. Because changes may often occur in response to industrial dissatisfaction with existing permit conditions, many changes are likely to be in areas where permits presently contain water-quality-based conditions; such changes would tend to be in the direction of less-stringent limits.

The general opinion expressed by the officials interviewed was that there would be little effect on the siting of new facilities. While most officials acknowledged that the proposed change in the antidegradation provision would tend to make it easier to site new facilities in areas of high water quality, and while many states oppose the proposed change, most officials believed that the actual effect on siting of new facilities would be academic. However, some state officials are concerned that the increased flexibility provided explicitly by the proposed regulation may possibly lead to forum-shopping by industry when siting new facilities. If such effects

were to occur, there is a possibility that permit conditions for some new facilities would be less-stringent if the facilities were sited in certain states rather than in others. While this subject is discussed and is a concern in some states, it is not clear what, if any, the actual effects would be, since the marginal differences in costs of water pollution control may not be significant enough to influence a siting decision. In any case, technology-based requirements would still have to be met in all states.

Concerns (not necessarily unanimous) expressed by state and EPA officials in regard to the proposed regulation include the following:

- The antidegradation policy should not be changed. However, positions both pro and con are taken by different states.
- Some state officials fear that optional guidelines may become requirements.
- Resources are not available to implement many suggested options. This is a very commonly expressed concern.
- Some state officials believe there exists the possibility of forum-shopping by industry. That is, they believe that lower standards may be accepted in some states than in others. This is disputed by other officials.
- Although a "priority" approach is advocated, there exists the possibility that the most significant problems may be avoided at times for political reasons.

Overall, the proposed regulation is generally viewed by the officials interviewed as refining the existing system and making it more efficient and openly flexible. The water-quality standards program would become more of a partnership, with diminished authority for EPA.

Although none of the state and EPA officials with whom it was discussed could quantify any possible effects of the proposed regulations on energy industries, most expressed the belief that little effect should occur in terms of industrial permits, in general, and in terms of permits for power plants and refineries, in particular. If changes do occur, the fact that many will be in response to pressure by industry means that they will often be in the direction of less-stringent, water-quality-based permit limits. Existing facilities with only technology-based requirements should experience little change.

The results presented in this section are based on a qualitative appraisal of the proposed regulation and on a substantial number of interviews with state and EPA officials. A more quantitative examination of the potential for effects on energy industries is presented in the next section.

3 POTENTIAL INFLUENCE OF THE PROPOSED REGULATION ON ENERGY INDUSTRIES

As described in the preceding section, the proposed water-quality standards regulation has the potential to influence the discharge permits and the siting of energy facilities. This section examines the potential for an influence on discharge permits in a more quantitative manner. The procedure used is outlined first, followed by a discussion of results obtained. Possible effects on the siting of new facilities are considered qualitatively. A case study is presented that illustrates how the proposed regulation has the potential to influence discharge permits. Finally, a general discussion is presented of the results obtained.

3.1 METHODOLOGY

It is instructive to examine in detail how the proposed regulation might influence limitations in discharge permits. The possible changes in permit limitations are related to possible changes in designated uses and to changes in water quality criteria. There are two possible outcomes related to a review of designated uses: (1) either the designated use is being attained, or (2) it is not being attained. If the designated use is not attained, then, following the guidance in the proposed regulation, the feasibility of attaining the use would be determined. If it is determined that attaining the use is feasible, then more-stringent limits must be placed in discharge permits. Although site-specific criteria may also be set, decreasing the discharge of pollutants will still be necessary in order to attain the designated use. Therefore, in this first case, in which a designated use is not attained but doing so is feasible, the permit limitations of some dischargers would be made more stringent. If attaining the designated use is not feasible, then that use would be modified or reclassified (formerly called downgraded). Even attaining a reclassified use that requires less-stringent criteria may still require more-stringent treatment than is presently used. It is likely, however, that in many cases the reclassification would result in less-stringent limits than those that are presently based on water quality. Therefore, in the second case, in which a designated use is not attained and it is not feasible to do so, permit limitations could be made either more stringent, or, more likely, less stringent (if they are now water-quality-based). If the designated use is being attained, then there are two possible outcomes. First, the existing criteria may be determined to be appropriate. In that case there would be no changes in permits. Second, site-specific criteria that are less stringent than existing criteria may be set. Permits that have water-quality-based limits on the parameters for which less-stringent criteria are set will then tend to be made less stringent. However, if the designated use was attained but existing criteria were exceeded, it is likely that the site-specific criteria would be set approximately equal to existing concentrations in the receiving water, at least in some cases. In such cases no actual changes in permits would occur. It seems unlikely that criteria would be made

more stringent if existing uses are attained or that more-stringent limits would be placed in the permits of dischargers to prevent any such more stringent criteria from being exceeded, given the basic approach of the proposed regulation. Such a conclusion seems reasonable since the proposed regulation emphasizes use, not individual water quality parameters. Because the designated use is attained in the case being considered, there would seem to be little reason to require further treatment, given the logic of the proposed regulation. The cases just discussed are outlined in Table 3.1.

For assessment purposes, existing facilities with direct discharges can be viewed as being in one of two categories: those whose permits have water-quality-based conditions in them and those whose permits do not. Independent of any changes in the proposed regulation, minimum technology-based requirements will remain for all facilities. (Removing the minimum technology-based requirements would involve changing the Clean Water Act.) Therefore, permits that now have no water-quality-based conditions in them cannot be made less stringent than they are at present, only more stringent. For permits with water-quality-based conditions, changes could occur in either direction. Since the proposed regulation encourages the states to focus on priority water-quality-limited segments, changes, if any occur, will often tend to affect plants having existing water-quality-based permit limits, because such facilities are in water-quality-limited areas.

The methodology used in this study focuses attention on facilities with existing water-quality-based conditions in their permits. Such facilities are located on water-quality-limited segments; they will therefore tend to be in priority areas. Although some facilities that do not presently have water-quality-based permit conditions may also be influenced, it is likely that a higher fraction of those with such permit conditions will experience some changes, if any do occur. An extensive inventory of energy facilities with water-quality-based permit limits exists.⁴ That inventory was used to select the facilities needed to examine the potential for effects on permits with water-quality-based limits. The inventory of facilities is given in Appendix C; the locations of the facilities in the inventory are shown in Fig. 3.1.

The potential for effects on energy facilities without water-quality-based permit limitations was also examined in a number of states. A comprehensive examination of all facilities in all states is a very large task. A more limited study will show the presence of any major trends that might be occurring in different regions of the nation.

For all facilities of interest, the location of each facility and the body of water receiving its wastewater discharges were determined. Information on the likely priority status of the receiving waters, on the attainment of designated uses, and on possible influences of the proposed regulation on the individual facilities was obtained from discussions with state officials and from state 305(b) reports.

Table 3.1 Probable Effects of the Proposed Regulation on Permits

Present Permit Limitations	Designated Uses Attained	Direction of Change of Limitations in Permits	
		Designated Uses Not Attained, But It Is Feasible To Do So	Designated Uses Not Attained And It Is Not Feasible To Do So
Water-quality-based limitations present	Possibly less stringent in some cases if less-stringent criteria are set	More stringent	Possibly less stringent; smaller possibility of more stringent
No water-quality-based limitations present	Probably no effect	More stringent	Some possibility of more stringent

Note: See text for full discussion.

Adoption of site-specific criteria may also have some influence on permit limitations, as has been noted. The principal water-quality parameters of interest for the energy industries examined are chlorine, metals, ammonia, dissolved oxygen, and dissolved solids. Development of site-specific criteria is appropriate for the first four parameters. Different organisms have different sensitivities to the presence of each of the substances. In addition, the concentrations of different species of metals and ammonia and of dissolved oxygen are sensitive to environmental variables. Within the concentration ranges of most interest, dissolved solids are usually of concern because of off-stream uses, so site-specific criteria seem less likely to be used for dissolved solids than for the other parameters listed.

Most major influences on permit limitations will probably be due to changes in designated uses, rather than due to adoption of site-specific criteria. Therefore, this study emphasizes the probable status of use-attainment of water bodies on which energy facilities are sited. Determination of possible changes in criteria because of site-specific effects is a very resource-intensive task. In fact, many of the states studied have expressed reservations because of the effort required to use site-specific criteria. Therefore, attempting to assess possible effects on a large scale in this study was not realistic. The potential for effects was identified by determining whether relevant facilities are sited on what are likely to be priority water bodies. Facilities sited in such areas could be influenced by changes in designated uses and by changes in criteria or both. An effort was

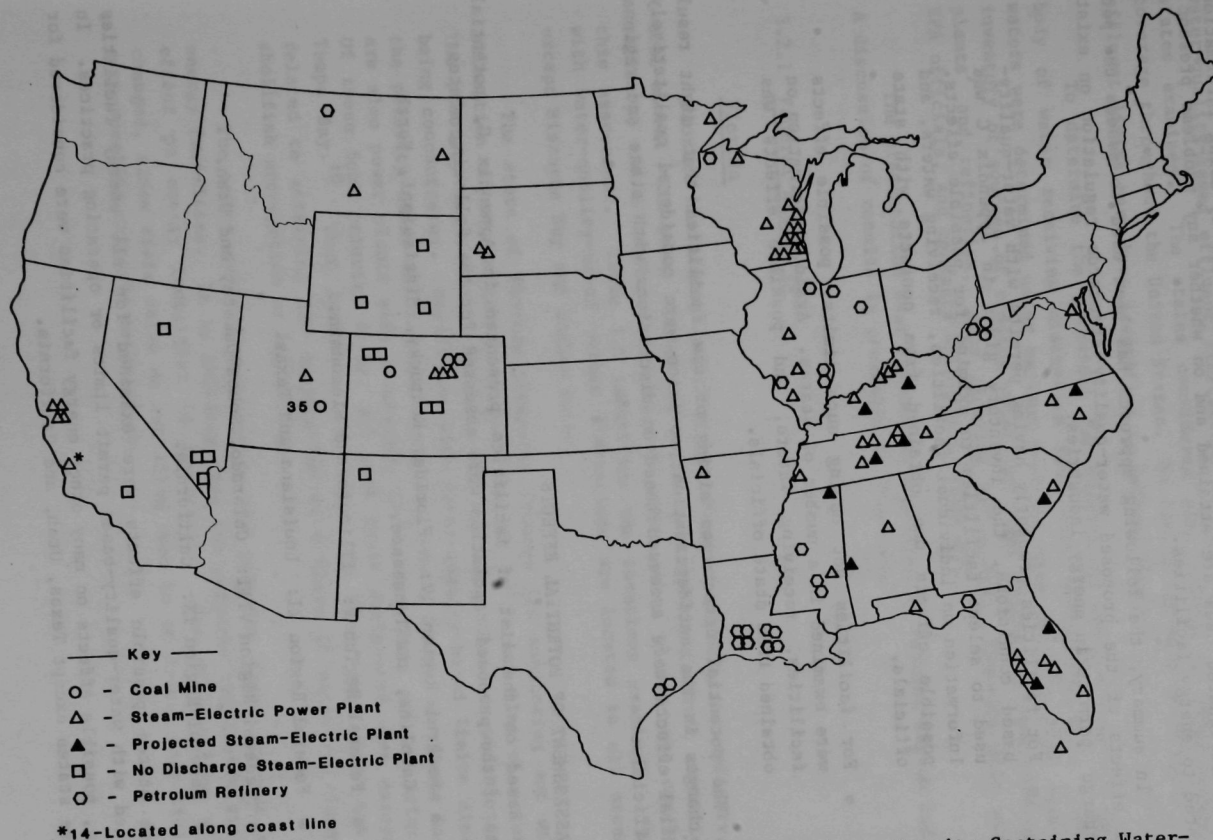


Fig. 3.1 Locations of Energy Facilities Identified with Discharge Permits Containing Water-Quality-Based Limitations or Whose Operations Have Been Influenced by Water-Quality Concerns. The facilities are identified Appendix C.

made to screen for the areas of most likely importance by using information on whether designated uses are attained and on whether any problems present are related to energy facilities.

In summary, the following approach has been used to assess the potential effects of the proposed water-quality standards regulation on existing discharge permits in energy industries:

- For facilities presently having permits with water-quality-based conditions, the inventory given in Appendix C was used to select facilities to examine for possible effects. Information on individual facilities, receiving waters, and possible effects was obtained from contacts with state officials.
- For facilities not having such limits, possible effects were examined in a number of states. Again, information on facilities, receiving waters, and possible effects was obtained from state officials.

The potential effects on siting of new facilities that might result from changes in the antidegradation provision were considered qualitatively. Potential effects were assessed based on discussions with state and regional EPA officials.

3.2 ASSESSMENT OF POTENTIAL EFFECTS

Based on the list of facilities presented in Appendix C, potential effects of the proposed regulation were assessed for the following states:

- Federal Region IV: Florida, Kentucky, Mississippi, North Carolina, and Tennessee.
- Federal Region V: Illinois and Wisconsin.
- Federal Region VI: Louisiana and Texas.
- Federal Region VIII: Colorado, South Dakota, and Utah.
- Federal Region IX: California.

In these states possible effects were examined for all energy facilities identified with water-quality-based permit limits or operating practices. In addition, possible effects on many other energy facilities were considered for all these states except Texas, Utah, and California.

The vast majority of energy facilities that have been identified with water-quality-based effluent limitations in their permits are located in the states examined. The states considered also provide a broad geographical coverage throughout the United States. No facilities with water-quality-based effluent limits have been identified in Federal Regions I, II, VII, and X.

To determine the potential for effects it was necessary to know the body of water receiving discharges from each energy facility. Receiving waters were determined using various sources: maps locating power plants,⁵ an inventory of sources of cooling water for power plants,⁶ inventories of power plants⁷ and refineries,⁸ maps locating refineries,⁹ contacts with state and EPA officials, and contacts with plant operators.

The presentation that follows is organized by Federal Region and state. A discussion of results is presented in Sec. 3.4.

3.2.1 Federal Region IV

Florida

Florida has a substantial number of power plants, one refinery, and no coal mines. All power plants with water-quality-based permit conditions, the refinery, and a substantial number of other power plants were considered in this assessment. Table 3.2 identifies the locations examined. Facilities with water-quality-based permit limitations are located in all areas listed except Biscayne Bay and Indian River.

The state of Florida presently focuses its monitoring and waste load allocation effort on certain areas, but has no formal list of priorities.¹⁰ The priority areas listed in Table 3.2 are among those on which attention is being concentrated. Facilities with water-quality-based limits discharge to the priority areas of Escambia River, St. John's River, and Tampa Bay. There are also power plants with discharges to Biscayne Bay, another priority area. Of these four priority areas, all meet their designated uses except part of Tampa Bay.¹⁰ That location, the upper Old Tampa Bay area, has problems related to attaining its designation as a Class II water -- classified for shellfish propagation or harvesting.

The water quality problems in the priority areas are not related to energy facilities. It is unlikely that the proposed regulation will have any effect on energy facilities in the state. Use designations will not be changed, since state rules do not allow that to be done. Only limited use of site-specific criteria is expected.

Table 3.2 Conditions in Florida

Area	Water Body	Energy Facilities ^a	Water Quality Problems ^b	Likely Priority Area? ^c
Northwest	Escambia River (near mouth)	1 Power Plant (1)	Stressed biological conditions, but no major chemical water quality problems; bay has poor quality but is improving. Problem with nutrients and toxics.	Yes
	St. Marks River	1 Refinery (1) 1 Power Plant	Excellent water quality; past concern with toxics from refinery.	No
Central	St. John's River	5 Power Plants (1)	Nutrient problems in some areas.	Yes
Central West Coast	Gulf of Mexico	2 Power Plants (1) (1 is projected)	None	No
	Tampa Bay	6 Power Plants	Nutrient problems in parts of bay.	Highest Priority
	Lake Parker	2 Power plants (2)	Small eutrophic lake.	No
East Coast	Indian River	5 Power Plants	None	No
	Biscayne Bay	2 Power Plants	General water quality problems.	Yes
	Atlantic	1 Power plant (1)		No
South	Gulf of Mexico (Florida Keys)	2 Power plants (1)	None	No

^aNumbers in parentheses indicate number of facilities that have water quality-based limits in their permits (or use practices) that are more stringent than Best Available Technology (BAT) or New Source Performance Standards (NSPS).

^bSource: Refs. 10 and 11.

^cSource: Ref. 10.

Kentucky

Water quality problems related to energy development are widespread in Kentucky. Acid drainage from abandoned coal mines, sediment from current surface mining of coal, and brines from oil and gas drilling have produced serious problems in some areas. These are no coal mines in the state with water-quality-based limitations; five power plants have such limits. Table 3.3 identifies the locations of power plants and active refineries in the state.

Kentucky has focused attention on priority segments during the last year.¹² The highest priority is given to segments with municipal treatment plants, because of the construction grants program; within this group, the highest priority is given to water-quality-limited segments. Generally, all higher-order streams are effluent-limited because of the available dilution. Of the streams listed in Table 3.3, only the Dix River is a possible priority area. A list of priority problem areas has also been developed recently.¹³ The priorities in the list may not correspond to priorities for reviewing water quality standards.

Table 3.3 shows that only one energy facility is located on a stream that is likely to be a priority area. Since the state is proceeding in the direction of placing emphasis on priority areas at present, without the proposed regulation being in effect, and since power plants and refineries are sited on large streams, the proposed regulation will probably have little effect on such facilities. As is common in other states, coal mines do not have water-quality-based permit conditions. However, water quality problems have resulted from mining, especially on smaller streams. Therefore, technology-based requirements are either not adequate to protect water quality in all cases or have not been applied to all mines. If use of a priority approach leads to increased attention to areas with water quality problems related to actual mining, it is possible that some added requirements may result.

Mississippi

There are numerous power plants and refineries in Mississippi; several refineries and two power plants have water-quality-based limits in their NPDES permits. Table 3.4 lists the locations considered; these include all refineries in the state and the vast majority of all power plants. Most facilities with water quality-based limits are sited on tributaries of the Pascagoula River.

Priority areas in Mississippi are not well-established. However, the state intends to develop priority areas based on pending permit action.¹⁵ The labels in Table 3.4 related to priority areas are based upon subjective appraisals and not on any plan established by the state. The power plants and refineries are not viewed as significant sources of water pollution. Use-attainability problems may exist on the Pearl River below Jackson and in portions of the Pascagoula basin.

Table 3.3 Conditions in Kentucky

Water Body	Energy Facilities ^a	Water Quality Problems ^b	Likely Priority Area? ^c
Ohio River	12 Power Plants (3 are projected) (3) 2 Refineries	Slight or moderate problems related to toxics, bacteria, solids and oil and grease.	No
Lower Green River	7 Power Plants (1 is projected) (1) (lower River)	Overall quality is fair to good with some problems related to nutrients and toxics.	No
Kentucky River	3 Power Plants (1 is projected) (1)	Fair quality overall; problems with nutrients, toxics, bacteria.	No
- Dix River	1 Power Plant	?	Possible
Upper Cumberland River	1 Power Plant 1 Refinery (on small tributary)	Generally good quality.	
Big Sandy	1 Power Plant	Overall, generally fair quality with problems related to toxics, bacteria and nutrients.	No

^aNumbers in parentheses indicate number of facilities that have water-quality-based limits in their permits (or use practices) that are more stringent than BAT or NSPS.

^bSource: Refs. 12 and 14.

^cSource: Ref. 12.

If changes do occur in permits as a result of the proposed regulation, they will probably result from requests for relief from dischargers who have experienced a problem meeting permit limits. Given the concentration of water-quality-based limits in the Pascagoula basin, the potential exists for such changes in that basin.

North Carolina

There are numerous power plants in North Carolina, but there are no refineries or coal mines in the state. Several power plants have water-quality-based conditions in their permits; Table 3.5 lists the locations of these and other power plants in the state.

Table 3.4 Conditions in Mississippi

Water Body	Energy Facilities ^a	Water Quality Problems ^b	Likely Priority Area? ^c
Mississippi River	3 Power Plants (1 is projected) 3 Refineries	Water quality is rated fair-good and stable; meets water quality standards	No
Pascagoula Basin	3 Power Plants (1) 4 Refineries (2)	Streams generally meet water quality standards	Yes
Yazoo Basin	3 Power Plants 1 Refinery (inactive) (1)	Fair-good quality; some effects due to agricultural sources	Yes (?)
Pearl River	1 Power Plant	Generally meets water quality standards except for bacteria problems below Jackson	Yes
Biloxi River	1 Power Plant	?	No

^aNumbers in parentheses indicate number of facilities that have water-quality-based limits in their permits (or use practices) that are more stringent than BAT.

^bSource: Ref. 16.

^cSource: Ref. 15.

North Carolina is presently devoting attention to segments with degraded water quality.¹⁷ Although there is no formal list of priorities corresponding to that suggested in the proposed regulation, the state is aware of where problems are located. The priority areas indicated in Table 3.5 are based on the occurrence of water quality problems. There are two locations with water quality problems that are related to power plants: Belews Lake and Hyco Lake. Because of the coal used at the plants sited on those lakes, there are selenium problems (with resulting fish kills) in the impoundments due to their circulation patterns. The plant sited on the John Kerr reservoir has not yet started operation, so it is not known if there will also be a problem there. All three of these facilities have water-quality-based limits on selenium. Dry handling of fly ash is being considered by the two operating facilities.

It appears unlikely that the proposed regulation will influence permits of existing facilities or affect siting of new facilities in North Carolina. Water quality problems related to power plants in the state are being addressed independently of the proposed regulation, and the plants involved are not located in likely priority areas.

Tennessee

The state of Tennessee does intensive surveys of important stream segments, but there is no formal program related to establishing priorities.¹⁹ It is expected that the state will concentrate on areas receiving municipal grants.

Table 3.7 Conditions in Illinois

Water Body	Energy Facilities ^a	Water Quality Problems ^b	Likely Priority Area? ^c
Illinois River Basin			
Sanitary and Ship Canal	4 power plants 1 refinery	severe	
Des Plaines River	1 power plant 1 refinery (1)	severe	yes
Kankakee River	1 power plant	intermediate-minor	
Illinois River	9 power plants (1)	moderate	
Lake Springfield	2 power plants	?	
South Fork Sangamon River	1 power plant	intermediate-moderate	
Mississippi River	5 power plants 2 refineries	minimum-intermediate	
Kaskaskia River Basin			
Kaskaskia River	1 power plant (1)	minimum-intermediate	yes
Coffeen Lake	1 power plant	?	
Ohio River	1 power plant	minimum	
Wabash River Basin			
Wabash River	1 power plant	minor-moderate	
- Embarrass River	1 power plant	minimum-moderate	
- Onion Creek	1 refinery (1) 1 refinery (1)	?	
Rock River	1 power plant	minor-moderate	yes
Big Muddy Basin			
- Crab Orchard Lake	1 power plant	?	
Lake Michigan	2 power plants		

^aNumbers in parentheses indicate numbers of facilities that have water-quality-based limits in their permits (or use practices) that are more stringent than BAT.

^bSource: Ref. 22.

^cSource: Ref. 21.

have limited effect. If changes do occur, they will probably result from requests by industry related to making permit conditions less stringent.

Wisconsin

There are a large number of power plants and one refinery in Wisconsin. Numerous power plants have water-quality-based limits on chlorine in cooling water discharges; Table 3.8 lists the locations of these and other energy facilities in the state. The power plants with water-quality-based permit limitations are sited on the Fox River, Lake Michigan, the Milwaukee River, the Mississippi River, the Rock River, Lake Superior, and the Wisconsin River.

Table 3.8 Conditions in Wisconsin

Water Body	Energy Facilities ^a	Water Quality Problems ^b	Likely Priority Area? ^c
Fox River Basin			
Lake Winnebago	1 power plant		No
Lower Fox River	1 power plant (1 is projected)	Heavily industrialized, large increases in ammonia, phosphates, and suspended solids compared to upstream areas.	Yes
Lake Michigan	10 power plants	PCBs and toxics.	Yes (near Milwaukee)
Milwaukee River	3 power plants	Combined sewer overflow; nonpoint sources.	Yes
Mississippi River	5 power plants	Generally improves down- stream from Minnesota.	No (near power plants)
Rock River Basin			
Lake Monona	1 power plant		No
Rock River	2 power plants	Severe effect due to agri- cultural and some municipal sources.	Yes
St. Louis River	1 refinery (1)		Yes
Lake Superior	2 power plants		No
Wisconsin River Basin			
Pine River	1 power plant		Yes (low priority)
Wisconsin River	2 power plants	Degraded because of heavy development	Yes

^aThe number in parentheses indicates the number of facilities that have water-quality-based limits in their permits more stringent than BAT.

^bSource: Refs. 23 and 24. PCB = polychlorinated biphenyls.

^cSource: Ref. 23.

Wisconsin expects to use a system that focuses on priority areas.²³ The likely priority of those water bodies with energy facilities is noted in Table 3.8. The facilities with water-quality-based limits generally discharge into priority receiving waters. Designated uses are attained in those waters, except for the Fox River.²³

Problems in priority areas are not related to energy facilities. It seems likely that the proposed regulation would have little effect on permits of existing facilities. Wisconsin has its own siting law for power plants, so no effect on the siting of new facilities is expected.

3.2.3 Federal Region VI

Louisiana

There are a large number of refineries and power plants in Louisiana. Water-quality-based limits have been placed in the permits of refineries on the Calcasieu and Mermentau Rivers. These limits are for BOD and ammonia; limits for sulfides have also been included for the refineries on the Mermentau.

The state is presently testing a priority approach for reviewing water quality standards.²⁵ The Calcasieu River and, to a lesser degree, the Mermentau are priority areas. The Calcasieu River near Lake Charles, where refineries are located, is a broad sluggish estuary. The stream is water-quality-limited and its lower reaches have the most-acute water quality problems in the state.²⁶ The Mermentau also has poor water quality, although it is classified as effluent-limited.²⁶ The Mississippi River below Baton Rouge is also a priority area. There are a very large number of industries discharging to the river, including refineries and power plants. Some reaches of the lower Mississippi are water-quality-limited. The designated use (fishery/recreation) for the Calcasieu is not being attained. There is some possibility of effects on designated uses for the Mississippi as well. Problems in the Calcasieu and Mississippi are not related specifically to the refineries there, since many other sources are present.

It is difficult to assess how the proposed regulation might affect permits and siting in Louisiana. However, there are numerous energy facilities (some with water-quality-based permit limits) sited on priority waterways that have degraded water quality and in some cases problems related to use attainment. Therefore, there is a definite potential for effects on existing permits. The proposed regulation may provide an avenue for industry to request relief. On the other hand, the priority approach could focus attention on problem areas, resulting in more stringent limits to protect valuable resources (e.g., use of the Mississippi River for water supply).

Texas

Texas has the largest number of steam-electric power plants and refineries in the nation. However, only two of these facilities, both refineries discharging into the Houston Ship Channel, have water-quality-based limits in their permits. These limits are for biochemical oxygen demand (BOD).

The state will attempt to use a priority approach that emphasizes some segments; the Houston Ship Channel is a priority area.²⁷ Appropriate water quality standards will not be met in the Ship Channel if dischargers apply only technology-based treatment requirements.²⁸ The Ship Channel receives discharges from nearly 500 municipal and industrial sources (there are a total of about 3400 dischargers in the state).²⁸ Although the water quality is deteriorated, it has improved due to additional wastewater treatment.

The potential effects in Texas of the proposed regulation are not clear. The two refineries with water-quality-based effluent limitations are located in an important priority area. However, problems in the area are not related to the refineries specifically, because of the large number of dischargers present, and conditions in the receiving water have improved. It appears²⁷ that it will be difficult for any downgrading of uses to occur in Texas. Because of the existing strong interest in the Ship Channel and because improvements have occurred there, it seems reasonable to expect that the proposed regulation, per se, will have little additional effect.

3.2.4 Federal Region VIII

Colorado

Table 3.9 lists the locations of the power plants and refineries in the state. The facilities are concentrated in the Platte and Arkansas river basins. Plants with water-quality-based permit limits are located in the Denver area. There are some no-discharge power plants near Colorado Springs and on the Yampa River.

The state of Colorado has already classified priority segments and has done some development of site-specific criteria.²⁹ Table 3.9 indicates which of the water bodies with energy facilities are considered to be priority segments. Of those segments with energy facilities, the following are considered to be priority areas: the South Platte River near Denver, the Colorado River near Grand Junction, and possibly the San Miguel River. Of these segments, only the South Platte has impaired uses²⁹: recreation because of fecal coliform bacteria and aquatic life because of unionized ammonia.

Overall, the proposed regulation should have no significant effect on energy facilities in the state. There are only a limited number of energy facilities in priority areas and problems in those areas are not generally related to energy facilities. There are generally no problems with coal mines, because they usually have no discharge. It is unlikely that the proposed regulation will have any effect on no-discharge power plants in the state unless industry reopens the cases.

The only possible water quality problems that result from existing facilities appear to be related to the Union Carbide uranium mill on the San Miguel River and the Zuni steam plant near Denver. In the latter case there may be a problem related to pH that leads to an in-stream ammonia problem. The case will be studied by the state.²⁹ The uranium mill is expected to go to no-discharge.

South Dakota

There are four steam-electric power plants in South Dakota; their locations are identified in Table 3.10. The Kirk plant on Whitewood Creek and the Ben French plant on Box Elder Creek have water-quality-based conditions in their permits.

Table 3.9 Conditions in Colorado

Water Body	Energy Facilities ^a	Water Quality Problems ^b	Likely Priority Area? ^c
Platte River Region			
South Platte River	5 power plants (3) 2 refineries (on Sand Creek, a tributary)(2?)	Most widespread and severe problems in the state. Ammonia problems due to municipal wastewater.	Yes - in and below Denver
Valmont Lake	1 power plant		No
Arkansas River Region			
Arkansas River	6 power plants (1 is projected)	Fecal coliform bacteria from municipal and agri- cultural sources. High dissolved solids in lower river.	Low priority (around Pueblo only)
Fountain Creek	2 power plants (no discharge) (2)	Some problem with fecal coliform bacteria.	No
Monument Creek	1 power plant		No
Rio Grande Region			
Rio Grande River	1 power plant	Some problem with metals from inactive mines; irrigation problems.	No
Purgatoire River	1 power plant	Some problem with metals from mine drainage.	No
Colorado River System			
Colorado River	1 power plant 1 refinery	Near Grand Junction there is an ammonia problem related to the municipal plant.	Yes, near Grand Junction
Yampa River	2 power plants (no discharge) (2)	Some problem with metals due to inactive mines.	No
San Miguel River	1 power plant 1 uranium mill	Some problem with ammonia, as well as with metals from mine drainage.	Will be if uranium mill doesn't stop its discharge
Uncompahgre River	1 power plant	Some problems with fecal coliform bacteria from municipal and agricultural sources.	No

^aThe number in parentheses indicates that number of facilities that have water-quality-based limits in their permits more stringent than BAT.

^bSource: Refs. 29 and 30.

^cSource: Ref. 29

South Dakota has been focusing its attention on priority areas,³¹ and the priorities indicated in Table 3.10 are well-defined. The only energy facility in the state that has water quality-based permit limits and that discharges into a priority water body is the Kirk plant on Whitewood Creek. As Table 3.10 shows, three of the four power plants are on priority water bodies.

Table 3.10 Conditions in South Dakota

Water Body	Energy Facilities ^a	Water Quality Problems ^b	Likely Priority Area? ^c
Big Sioux River	1 power plant (Pathfinder)	Municipal and agricultural sources	Yes
Big Stone Lake	1 power plant (Big Stone)	Eutrophication	Yes
Box Elder Creek (tributary of Belle Fourche River)	1 power plant (Ben French) (1)	Low flows	No
Whitewood Creek (tributary of Cheyenne River)	1 power plant (Kirk) (1)	Severely polluted by mine wastes	Highest priority in state

^aNumber in parentheses indicate the number of facilities that have water-quality-based limits in their permits that are more stringent than BAT.

^bSource: Refs. 31 and 32.

^cSource: Ref. 31.

The water quality problems in receiving streams are generally not related to the power plants. The only exception is the Kirk plant, which is considered to be a minor problem.

There have been concerns related to designated uses on the four bodies of water listed in Table 3.10. Big Stone Lake is probably not meeting its designated uses of primary contact and warm-water fishery very well because of algae - the lake has a eutrophication problem. The conditions on the Big Sioux River will be improved when Sioux Falls completes its treatment plant. Designated uses on Box Elder Creek were changed in 1980. None of the problems in these areas relate to the power plants, and possible changes in uses seem unlikely to affect the permits of the power plants. Conditions on Whitewood Creek are different, however. A request for a change in designated uses that could influence the power plant's permit was made recently. The outcome is discussed in Sec. 3.3 as an example of how changes in uses in priority areas could influence the permits of energy facilities.

Utah

A power plant and about 35 coal mines in Utah have water-quality-based conditions in their discharge permits on total dissolved solids (TDS). The limits were added to prevent degradation of existing conditions and are related to salinity problems. No added treatment is required.

The state of Utah expects little change to occur as a result of the proposed regulation.³³ In particular, no downgrading of uses is expected and there should be no effect on the permits of the energy facilities with limits on TDS.³³

3.2.5 Federal Region IX

California

Water quality considerations have not been a major influence on energy facilities in California. Five power plants in the San Francisco Bay area are required to dechlorinate their effluents and one power plant in southern California (Cool Water) has no discharge because of a concern for ground-water quality. In addition, numerous power plants along the Pacific Coast are subject to requirements of the California Ocean Plan.³⁴ These requirements are applied statewide and result in many added limitations in the permits of power plants discharging into the Pacific Ocean. Additional treatment is generally not required.

If the proposed regulation is adopted, it is expected that it would have little effect on any of the energy facilities in the state with water-quality-based permit conditions. The five power plants in the San Francisco Bay area have water-quality-based limits less stringent than BAT requirements. Therefore, those limits should disappear in their second-round permits. The limits on the Cool Water plant are to protect ground water, not surface water, so the proposed regulation is not relevant. Finally, the additional limits placed in permits of plants discharging to the Pacific Ocean were developed using a priority approach and site-specific detail as recommended by the proposed regulation. Although technical details could be disputed, the adoption of the proposed regulation should have no influence on these energy facilities, since the state has already proceeded in what appears to be a consistent direction.

3.3 CASE STUDY

Although during the course of this study no clear-cut cases were identified demonstrating how adoption of the proposed regulation would definitively influence discharge permits at energy-sector facilities, several observations concerning potential changes can be made.

- In general, the impetus for changes in designated uses and in permit conditions does not seem likely to come directly from most of the states.
- If changes do occur, most pressure for change will be from dischargers (including energy industries) requesting relief from present permit conditions.
- Permits at energy facilities could be influenced by actions related to other dischargers.

The case study presented briefly in this section belongs in all three of the above categories. While the case did not result in any obvious way from the proposed regulation, it is illustrative of the type of events that might result more frequently if the regulation is adopted.

The illustration presented here involves Whitewood Creek, a tributary of the Belle Fourche River, located in the Black Hills of western South Dakota. Although water quality in the western Dakotas is generally poor, the Black Hills are an exception; however, mining and smelter operations have degraded water quality very seriously on some streams.³⁵ Conditions in the Whitewood Creek area are described in a 1975 report as follows:³⁶

The mining of gold placers in the Black Hills in the late 1870's caused disruption and pollution of the streams. Discharge of mine wastes into streams continued with the development of bedrock mines. Virtually all of these mining activities and related pollution have now ceased. The single exception is the Homestake gold mine at Lead, which has been operated almost continuously for nearly 100 years, and is now the most productive gold mine in the United States. During this time, an estimated total of 65 million tons of tailings have gone into Whitewood Creek, a tributary of the Belle Fourche and Cheyenne Rivers.

Whitewood Creek at Whitewood has an average discharge of about 25 cfs and carries about 2,700 tons per day of silt, mostly crushed quartzite. Mercury was formerly used in the amalgamation of gold, and an estimated 12 to 40 pounds of mercury was lost each day into Whitewood Creek. A preliminary check on the mercury level in the flesh of fish in the Cheyenne River arm of the Oahe Reservoir showed that the levels were in excess of the Food and Drug Administration's guideline of 0.5 parts per million (ppm). Other toxic effluents discharged by Homestake are average daily loads of 312 pounds of cyanide, 240 pounds of zinc, and 9.5 tons of arsenopyrite. The arsenopyrite is oxidized, resulting in arsenic concentrations in the Cheyenne River that are four times greater than the U.S. Public Health Service water-supply criterion.

Untreated municipal waste from Lead and Deadwood also contributes to the pollution of Whitewood Creek, and would constitute a health hazard were it not for the fact that virtually all organisms are killed by the mining wastes. Homestake discontinued using the mercury amalgamation process in December 1970. However, the large quantities of mercury as well as arsenic and cyanide contained in the alluvial deposits along Whitewood Creek and the Belle Fourche and Cheyenne Rivers may be an environmental hazard for years to come. The mercury content in shallow ground water in these deposits is higher than the recommended limit of 0.5 ppm for drinking water.

The Homestake gold mine discharges to Gold Run Creek, a tributary of Whitewood Creek. The Kirk power plant, operated by Black Hills Power and Light, is located on Whitewood Creek upstream of the confluence with Gold Run Creek. The plant is a small (34-MW) coal-fired facility.

A more contemporary picture of conditions on Whitewood Creek is provided by the State of South Dakota:³²

Whitewood Creek water quality upstream of the Gold Run Creek confluence at Lead is good but from the Gold Run Creek confluence to the Belle Fourche River it is extremely poor. Mine wastes have been discharged to this reach from hundreds of mines for over 100 years. The last major discharge of tailings was ceased in 1977 when Homestake Mining Company began using its newly constructed tailings pond. A dramatic improvement in the quality of the water was noted at that time and also later when the Lead-Deadwood Sanitary District began operation of its new wastewater treatment facility. Many problems still exist, however. Monitoring data shows high levels of cyanide, arsenic, nickel, copper, ammonia, suspended solids, and fecal coliform bacteria. Reports have also been received of oil sheens on the water and elemental mercury in the sediments. Although further study is needed it appears that the probable sources are mine tailings from previous discharges from Homestake Mining Company and abandoned mines, current placer mining operations, current discharges from Homestake Mining Company, storm runoff and wastewater discharges from Lead-Deadwood Sanitary District and the City of Whitewood, and Kirk Power Plant. Studies are currently being conducted to investigate the possibility of other pollutants and pollutant sources being present.

The problems in Whitewood Creek carry down-stream into the Belle Fourche River. The water quality of the Belle Fourche River down-stream of Whitewood Creek is poor due to the Whitewood Creek sources and also because of irrigation which causes high dissolved solids concentrations. The Belle Fourche River upstream of Whitewood Creek has considerably better water quality although some water quality degradation does occur primarily from unidentified Wyoming sources.

As noted in Sec. 3.2.4, Whitewood Creek is considered to be a top priority area in the state. The major problem there is associated with the Homestake mine. The Kirk plant is considered to be a minor problem. However, the power plant has extensive water-quality-based conditions in its discharge permit, including limits on many metals. The permit conditions are related to those for the Homestake gold mine. The power plant has had difficulty meeting its permit limitations. Problems are related to zinc (from maintenance chemicals), copper (probably from piping), and suspended solids.

Water quality standards have been established for three segments of Whitewood Creek.³⁷ The segments and their designated uses are given in Table 3.11.

There has recently been a dispute over use designations on Whitewood Creek. Homestake requested a change in designated use on segments 2 and 3 from immersion recreation to limited-contact recreation and a change on segment 3 from a cold-water permanent fishery to a cold-water marginal fishery. A hearing was held and the decision was, first, that the request for the change from immersion recreation was denied, and, second, that segment 2 was extended eight miles upstream, to the confluence with Gold Run Creek, i.e., the designated use was changed from a cold-water permanent fishery to a cold-water marginal fishery for that portion of the stream.³⁸ The results of the hearing can be appealed, but are considered to be final.

The change in designated use will not necessarily affect the power plant's permit. However, the utility could request a change. If the request for a change in designated uses had been approved as was requested, it is possible that limits on metals in the power plant's permit may have been changed by an appreciable amount.

The request for a change in designated uses did not explicitly involve the proposed water-quality standards regulation. A study had been under way by the mining company for some time. However, the case involves a priority area and a question of attainability of a designated use. Therefore, the case illustrates what can happen in other areas and fits the pattern expected if states follow the guidance in the proposed regulation. Note that the request for a change came from an industry. The permit of an energy facility could have been influenced as an indirect consequence of the request. However, operators of energy facilities might also request such actions themselves.

3.4 DISCUSSION

An attempt has been made to assess systematically the potential effects that the proposed water-quality standards regulation may have on energy industries. This was done by placing primary emphasis on situations where significant effects might occur: energy facilities sited on priority water bodies. It is in such cases that the proposed regulation is most likely to have an influence, assuming that states follow its guidelines.

Table 3.12 provides some statistics on energy facilities located in priority areas in those states studied in detail. The format of the table is similar to that used in Table 3.1. Although the feasibility of attaining uses is not known, Table 3.12 can be compared, in other respects, directly with Table 3.1 to assess how the facilities in the different classes shown might be affected by the proposed regulation. There are a number of facilities sited in areas where designated uses are not attained. (There are also other such

Table 3.11 Stream Segments and Uses on Whitewood Creek, South Dakota

Segment	Designated Uses
1. From Belle Fourche River to U.S. Hwy I-90	Warm-water semipermanent fishery Limited-contact recreation
2. From U.S. Hwy I-90 to Northern Deadwood city limits	Cold-water marginal fishery Immersion recreation Limited-contact recreation
3. Above Northern Deadwood city limits	Cold-water permanent fishery Immersion recreation Limited-contact recreation

Definitions: A cold-water permanent fishery is capable of "supporting a permanent trout fishery from natural reproduction or fingerling stockings". A cold-water marginal fishery is suitable for "supporting stockings of catchable-size trout during portions of the year, but due to low flows" etc., is not suitable for a permanent cold-water fish population. A warm-water marginal fishery will support "more tolerant species of fish with frequent stocking and intensive management but suffers frequent fish kills because of critical natural conditions." Immersion recreation means that the water is suitable for uses "where the human body may come in direct contact with the water, to the point of complete submersion", etc. Limited contact recreation means that a water is suitable for boating, fishing and recreation other than immersion recreation.

Source: Ref. 37.

facilities in Louisiana and Texas.) The potential exists for some effect on the permits of some of these facilities; however, a number of the facilities are sited on water bodies whose water quality problems are not related to the facilities. The numbers in the table provide upper bounds on the number of facilities potentially affected (~10 power plants and 6 refineries in the nine states). There are also a number of other facilities with water-quality-based permits sited in priority areas where designated uses are presently attained. As Table 3.1 indicates, there is some possibility that permit limits for such facilities could be made less-stringent, if new, less-stringent, site-specific criteria were adopted. Table 3.12 shows that the number of facilities in this

Table 3.12 Occurrence of Facilities in Priority Areas^a

Present Permit Limitations	Number of Facilities		
	In Areas Where Designated Uses Are Attained	In Areas Where Designated Uses Are Not Attained	Total
Water-quality-based limitations more stringent than BAT or NSPS present	7 power plants 2 refineries	5 power plants 4 refineries	12 power plants 6 refineries
No water-quality- based limitations in permit ^b	>44 power plants 2 refineries	>5 power plants 2 refineries	>49 power plants 4 refineries

^aFor the States of Colorado, Florida, Illinois, Kentucky, Mississippi, North Carolina, South Dakota, and Wisconsin. A total of 158 power plants and 23 refineries were considered in these states. Results are based on material presented in this report.

^bThe numbers for power plants are given as ">" because in some states a limited number of power plants not having water-quality-based permit limitations were not included in the analysis. However, these plants are not all likely to be in priority areas and the numbers given should be close to the actual totals.

category is small (7 power plants and 2 refineries). Since it seems highly unlikely that all, or even a majority, of the facilities in the category (which is composed of only a small number of facilities) would be influenced by changes in criteria, the probability of any significant effects related to changes in water quality criteria is small. This conclusion is reinforced by the fact that although states generally favor site-specific criteria, many will make limited use of the concept.

The siting of new facilities might be influenced by proposed changes in the antidegradation provision. Although it is difficult to assess such effects quantitatively, the general opinion of state and EPA officials is that any significant effects are unlikely.

Summaries of potential effects by state are given in Tables 3.13 and 3.14. The first of the two tables presents opinions obtained from state officials. These opinions were not based on careful analyses, but merely represent subjective reactions of individuals familiar with conditions in their states. There were no cases in which an official expressed the opinion that there would be potentially large effects. "Possibly" in Table 3.13 means

Table 3.13 Effect of Adoption of the Proposed
Regulation on Energy Facilities:
Opinions of State Officials

State	<u>Will Energy Facilities be Influenced?^a</u>		
	Possibly	Not Likely	Uncertain
Colorado		x	
Florida		x	
Illinois			x
Kentucky			x
Louisiana			x
Mississippi			x
North Carolina		x	
South Dakota	x		
Tennessee	x		
Texas			x
Utah		x	
Wisconsin		x	

^aBased on contacts referenced in Sec. 3.3.

"Uncertain" means either uncertainty of state official or uncertainty concerning the official's opinion. "Possibly" means only that some changes are possible.

only that some changes are possible. Table 3.14 is a summary of the results from Sec. 3.2. In the table "potential" relates only to the likelihood that there may be some effect, not to its magnitude or to the number of facilities involved.

The overall conclusion that can be drawn from Tables 3.12-3.14 is that if the proposed regulation is adopted in its present form it is likely to have no major effect on existing or new energy facilities either in the aggregate or in most states. Isolated cases might well occur in which permit conditions would be influenced. However, there is no broad potential for important changes. Only limited effects seem likely to occur because of change in either designated uses or water quality criteria.

Table 3.14 Effect of Adoption of the Proposed Regulation
on Energy Facilities: Assessment Based on This Study

State	Will Energy Facilities be Influenced?		
	Significant Potential	Low Potential	Uncertain
Colorado		x	
Florida		x	
Illinois		x	
Kentucky			x
Louisiana	x		
Mississippi			x
North Carolina		x	
South Dakota	x		
Tennessee			x
Wisconsin		x	

NOTE: No attempt was made to quantify the magnitude of possible effect. Only the potential for some effect was assessed. In some states, not all energy facilities were considered.

4 CONCLUSIONS

Although the potential exists for some influence on energy industries if the proposed water-quality standards regulation is adopted in its present form, the results of this study indicate that any such effects are likely to be minor. The proposed regulation is generally viewed in the regulatory community as a refinement of the existing regulation; it is believed to provide more flexibility to the states and to allow for a more efficient program of water quality management. The most important features of the proposed regulation are the explicit options provided to the states. In particular, the focusing of attention on priority bodies of water is encouraged, as are conducting use-attainability analyses and using site-specific criteria. Another important feature in the proposed regulation is the proposed change in the antidegradation policy. There probably will be no major changes in the programs of most states if the proposed regulation is adopted, although states may give more attention to priority areas. The proposed regulation provides the states with more flexibility in revising water quality standards. However, the pressure for changes in standards would often come not from the states, but from dischargers seeking relief from existing permit conditions that are based on water quality standards. Therefore, although the potential could exist for permit modifications in the direction of either more or less stringency, any changes would often tend to involve reductions in limits, because pressures for such changes would tend to be the strongest. If the proposed regulation is adopted, the most likely effects on energy industries would probably involve existing facilities that are located on priority water bodies and that have water-quality-based conditions in their permits. Although there is no reason to believe that the permits of many such facilities would be affected, attention would often tend to be focused on such permits either as the result of efforts made by the operator of the facility or by other dischargers on the same body of water. The likely effect of the proposed regulation on the siting of new facilities is widely viewed as being negligible.

The potential for effects on energy facilities was examined in this study using two approaches. First, opinions were obtained from a number of officials in state regulatory agencies and in regional offices of the EPA. The most common opinion was that there would be little effect on energy industries if the proposed regulation were adopted in the present form. However, there were a significant number of officials who expressed some uncertainty about the possible outcome. Second, the potential for effects was assessed in a number of states in a more quantitative manner by determining the frequency with which energy facilities, especially those with water-quality-based permit conditions, are sited on water bodies that are considered, or are likely to be considered, state priority areas. The vast majority of the facilities that have been identified with water-quality-based permit limitations are located in the states examined. The analysis showed only a limited number of facilities located on priority receiving waters for which

attainment of designated uses appears to be in question. In addition, the number of cases in which adoption of site-specific criteria could influence permits is small. Therefore, the conclusion of this study must be that the potential for effects on energy facilities appears to be low, unless the state officials contacted frequently misjudged the attainment of uses and the location of priority areas. Without further analysis, this conclusion cannot be generalized to other industries because of differences in siting patterns.

Postscript

The proposed water-quality standards regulation has received considerable criticism, primarily from environmental groups concerned that its adoption might result in adverse effects on water quality. However, significant criticism has also come from other sources, notably from many states and from Congress. Some concerns expressed over the proposed regulation involve the changes in the antidegradation provision, the possibility of lowering of water quality standards, the encouraged use of benefit-cost assessments, and the possible lack of national consistency in reviews by EPA. A Senate bill (S.431) has been introduced that would require that states "maintain as a minimum use of a waterway, the designated use as of January 1, 1983, and that any new or revised standard for the waterway maintain that use." Reservations of the states have been expressed formally by the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA). ASIWPCA has stated that the proposed regulation needs "significant modification."³⁹ Since the proposed regulation seems intended to promote the interests of the states, such a comment is quite significant. In particular, ASIWPCA has indicated support for retaining the existing antidegradation provision and for dropping the cost-benefit assessment and the use-attainability analysis provisions of the proposed regulation. The Association has also urged "uniform and equitable U.S. EPA review procedures among all regions for criteria, uses, and interpretation of standards application".³⁹ Given the sources involved and the tenor of the criticism received, it is likely that the proposed regulation will not be promulgated in its present form. However, the final form and fate of the proposed regulation are uncertain.

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APPENDIX A: PROPOSED WATER-QUALITY STANDARDS REGULATION

A.1 OVERVIEW

The proposed regulation¹ consists of four subparts, A through D, as outlined below. The full text of the proposed regulation is presented in Sec. A.2.

Subpart A ("General Provisions"). This subpart defines the scope of the regulation (§131.1), provides definitions (§131.2), defines the responsibilities of the states and the EPA related to water quality standards (§131.3-131.4), and gives the minimum requirements for each state's water quality standards submitted to EPA for review (§131.5).

Under the proposed regulation the states are responsible (as they have been) for establishing and revising water quality standards (§131.3). EPA is responsible (as in the past) for review and approval of these standards (§131.4). If the standards adopted by a state do not meet the requirements of the Clean Water Act, EPA must disapprove the standards and promulgate federal standards as required under Sec. 303(c)(4) of the Clean Water Act.

The proposed regulation is explicit concerning the minimum requirements for water quality standards submitted to EPA for review (§131.5). Those requirements are the following:

- Designation of uses consistent with Sec. 101(a)(2) (swimmable, fishable goal) and Sec. 303(c)(2) of the Clean Water Act. (The latter requires that the standards "protect the public health or welfare, enhance the quality of water and serve the purposes of [the Clean Water Act]. Such standards shall be established taking into consideration their use and value for public water supplies, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other purposes, and also taking into consideration their use and value for navigation.")
- Inclusion of "methods used and analyses conducted to support water quality standards revisions." This would be a new requirement.
- Adoption of water quality criteria to protect the designated uses [as required by Sec 303(c)(2) of the Clean Water Act].
- Inclusion of an antidegradation policy statement that existing uses would be maintained.

- "Certification by the State Attorney General that the water quality standards were duly adopted pursuant to state law." This would be a new requirement.
- Inclusion of relevant general information.

Subpart B ("Establishment of Water Quality Standards"). This subpart is concerned with use designations (§131.10), optional analyses for changing or modifying uses (§131.11), establishment of water quality criteria (§131.12), and adoption by the states of other policies related to water quality standards (§131.13).

The proposed regulation contains a number of requirements related to the designation of uses (§131.10); it also explicitly provides a number of options to the states concerning uses. Each state would be required to:

- Specify appropriate water uses to be achieved and protected [§131.10(a)]. Use as a public water supply, the protection and propagation of fish, shellfish, and wildlife, recreation, agricultural and industrial use, and navigation must be considered.
- Develop and adopt a statewide antidegradation policy to maintain existing uses [§131.10(c)].
- Provide notice and an opportunity for a public hearing prior to changing or modifying uses [§131.10(f)].

The proposed regulation specifies conditions under which a state may modify or change designated uses [§131.10(h)] and under which a state may not modify or change such uses [§131.10(i)]. The conditions are generally similar to those in the present regulation. However, it is stated explicitly that changes are permitted if attaining a use is not feasible because of physical conditions, including flow or water levels, because of hydrologic modifications, or because the benefits of attaining the use do not bear a reasonable relationship to the cost. It is also stated explicitly that revisions based on anticipated growth are not allowed. An attainable use is defined as one that can be achieved by application of the technology-based effluent requirements of the Clean Water Act and by "cost-effective and reasonable" best management practices for control of nonpoint sources [§131.10(d)].

Under the proposed regulation, states have the option of adopting subcategories of aquatic protection use (e.g., warm-water and cold-water fisheries) [§131.10 (b)]; they are encouraged to adopt seasonal uses rather than reclassify a water body or segment to uses requiring less-stringent criteria [§131.10(g)]. They are also encouraged to conduct a use-attainability analysis and a benefit-cost assessment, if appropriate, before

revising a designated use [§131.10(e)]. These options are not given explicitly in the existing regulation, but are also not prohibited by it.

The optional use-attainability analysis and the benefit-cost assessment encouraged by §131.10(e) are discussed in more detail in §131.11. The latter paragraph describes the goals of the analysis or assessment. More-detailed guidance has also been provided by EPA.³

Requirements concerning adoption of water quality criteria are provided in the proposed regulation (§131.12). States are required to:

- Adopt criteria compatible with protecting a designated use [§131.12(a)(1)] and that are adequate to support the designated uses [§131.12(c)(1)].
- Establish criteria that protect downstream uses [§131.12(c)(3)].

States are given the option of adopting criteria for toxic pollutants if necessary [§131.12(a)(2)]. EPA encourages them to do so. The form of the criteria adopted by the states is also optional and may be numerical or narrative. EPA recommends the use of numerical values. These may be based on EPA's guidance criteria or on site-specific criteria developed by the state. EPA is providing guidance for development of site-specific criteria.³ The requirements concerning criteria are similar to those in the existing regulation. However, the options address issues not considered explicitly in the present regulation.

The proposed regulation also provides for the adoption of general policies by the states (§131.13). Such adoption is discretionary, but states are encouraged to adopt policies related to mixing zones, variances, and low-flow exemptions. Conditions under which variances may be granted to individual dischargers are given [§131.13(c)] and some guidance related to the use of mixing zones is provided [§131.13(b)]. While the adoption of general policies is not discussed in the present regulation, states commonly adopt policies that have not been required; in particular, states often have policies related to mixing zones in their water quality standards.

Subpart C ("Procedures for Review and Revision of Water Quality Standards"). This portion of the proposed regulation deals with the review and revision of water quality standards by the states (§131.20), the review and approval of standards by EPA (§131.21), and the promulgation by EPA of water quality standards (§131.22).

A.2 TEXT OF THE PROPOSED REGULATION

The text on the following pages is reproduced from:

U.S. Environmental Protection Agency, *Water Quality Standards Regulation*, proposed rule, 47 Fed. Reg. 49,234 (to be codified at 40 C.F.R. pt. 131) (proposed October 29, 1982).

PART 35—STATE AND LOCAL ASSISTANCE

PART 120—WATER QUALITY STANDARDS

§ 35.1550 (Removed)

1. Section 35.1550 is removed.

§§ 120.1–120.3 (Removed)

2. Sections 120.1 through 120.3 are removed.

§§ 120.10, 120.12 and 120.34

[Redesignated as Subpart D, §§ 131.30, 131.31, and 131.32, respectively]

3. Sections 120.10, 120.12, and 120.34 are proposed to be redesignated as Subpart D, Part 131, 131.30, 131.31 and 131.32, respectively.

4. Sections 120.27, 120.37, 120.43 and 120.45 are removed.

5. Part 131 is added as set forth below:

A. The table of contents for Part 131 is added as follows:

PART 131—WATER QUALITY STANDARDS

Subpart A—General Provisions

Sec.

131.1 Scope.

131.2 Definitions.

131.3 State Authority.

131.4 EPA Authority.

131.5 Minimum requirements for water quality standards submission.

Subpart B—Establishment of Water Quality Standards

131.10 Designation of uses.

131.11 Analyses for changing or modifying uses.

131.12 Criteria.

131.13 General policies.

Subpart C—State Review and Revisions of Water Quality Standards

131.20 State review and revision of water quality standards.

131.21 EPS review and approval of water quality standards.

131.22 EPA promulgation of water quality standards.

Subpart D—Federally Promulgated Water Quality Standards

131.30 Alabama.

131.31 Arizona.

131.33 Mississippi.

Authority: Clean Water Act, Pub. L. 92-500, as amended; 33 U.S.C. 1251 et seq.

B. Subparts A through C are added as set forth below:

Subpart A—General Provisions

§ 131.1 Scope.

This part describes the requirements and procedures for developing, reviewing, revising and approving water quality standards by the States as

authorized by Section 303(c) of the Clean Water Act.

§ 131.2 Definitions.

(a) "The Act" means the Clean Water Act (Public Law 92-500, as amended, (33 U.S.C. et seq.)).

(b) "Criteria" are elements of State water quality standards and represent a constituent concentration or level associated with a degree of environmental effect upon which scientific judgment may be based. When a criterion for a constituent is not exceeded, water quality will generally protect the designated use. A criterion, in some cases, may be a narrative statement instead of a constituent concentration.

(c) "Section 304(a) criteria" are information developed by EPA under authority of Section 304(a) of the Act. This information is issued periodically to the States as guidance for use in developing criteria.

(d) "Uses" are the beneficial uses of a particular body of water.

(1) "Attain" means to achieve a use of a water body.

(2) "Existing uses" are those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards.

(3) "Designated uses" are those uses specified for each segment in water quality standards, whether or not they are being attained.

(e) "Water quality standards" are provisions of State or Federal law which consist of a designated use or use for a water body and criteria to support those uses. Water quality standards are to protect the public health or welfare, enhance the quality of water and serve the purposes of the Act.

(f) "States" include: the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, Virgin Islands, American Samoa, the Trust Territory of the Pacific Islands, and the Commonwealth of the Northern Mariana Islands.

§ 131.3 State authority.

States are responsible for establishing and revising water quality standards. Under Section 510 of the Act, States may develop water quality standards more stringent than required by this regulation.

§ 131.4 EPA authority.

Under Section 303(c) of the Act, EPA is to review and approve State-adopted water quality standards. This review involves a determination: (a) that the State has adopted water uses which are

consistent with the requirements of the Clean Water Act; (b) that the State has adopted criteria to protect the designated water uses; (c) that the State has followed its legal procedures for establishing or revising standards; and (d) that the State standards decision-making process is based upon appropriate technical and scientific data and analyses. EPA must disapprove the standards and promulgate Federal standards under Section 303(c)(4) of the Act, if State adopted water quality standards do not meet the requirements of the Act. EPA may also promulgate a new or revised standard where necessary to meet the requirements of the Act.

§ 131.5 Minimum requirements for water quality standards submission.

The following elements must be included in each State's water quality standards submitted to EPA for review:

(a) Use designations consistent with the provisions of sections 101(a)(2) and 303(c)(2) of the Act.

(b) Methods used and analyses conducted to support water quality standards revisions.

(c) Water quality criteria sufficient to protect the designated uses.

(d) An antidegradation policy statement on maintaining existing uses.

(e) Certification by the State Attorney General that the water quality standards were duly adopted pursuant to State law.

(f) General information which will aid the Agency in determining the adequacy of the scientific basis of the standards as well as information on general policies applicable to State standards which may affect their application and implementation.

Subpart B—Establishment of Water Quality Standards

§ 131.10 Designation of uses.

(a) Each State must specify appropriate water uses to be achieved and protected. The classification of the waters of the State must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial, and other purposes including navigation.

(b) States may adopt subcategories of the aquatic protection use to reflect varying needs of different aquatic communities.

(c) States must develop and adopt a statewide antidegradation policy to maintain existing water uses.

(d) At a minimum, uses are deemed attainable if they can be achieved by the

imposition of effluent limits required under Section 301(b) (1) and (2) of the Act (including modifications under Section 301(c) of the Act) and cost-effective and reasonable best management practices for nonpoint source control.

(c) States are encouraged to conduct a use attainability analysis and a benefit cost assessment, if appropriate, when revising a designated use of a water body or any portion thereof. These analyses are described in § 131.11. States may also choose other appropriate analyses.

(f) Prior to adding, removing or modifying any use, the State shall provide notice and an opportunity for a public hearing under § 131.20(b) of this regulation.

(g) States are encouraged to adopt seasonal uses as an alternative to reclassifying a water body or segment thereof to uses requiring less stringent water quality criteria. If seasonal uses are adopted, water quality criteria should be adjusted to reflect the seasonal uses.

(h) States may modify or reclassify a designated use which is not an existing use as defined in § 131.2, if the State determines that attaining the use is not feasible because:

(1) Naturally occurring pollutant concentrations prevent the attainment of the use; or

(2) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the propagation or survival of fish and other aquatic life, unless these natural conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or

(3) Human caused conditions or sources of pollution cannot be remedied or would cause more environmental damage to correct than to leave in place; or

(4) Dams, diversions or other types of hydrologic modifications interfere with the attainment of the use, where it is not feasible to restore the water body to its original condition or to operate such modification in a way that will maintain the use; or

(5) Physical conditions unrelated to water quality preclude attainment of the use; or

(6) Benefits of attaining the use do not bear a reasonable relationship to the costs.

(i) States may not modify or reclassify designated uses if:

(1) They are existing uses as defined in § 131.2 unless uses requiring more stringent criteria are added; or

(2) Uses will be attained by implementing effluent limits required under Sections 301(b) (1) and (2) of the Act (including modifications under Section 301(c) of the Act); or

(3) Uses will be attained by implementing cost-effective and reasonable best management practices for nonpoint source control; or

(4) The revision is based on anticipated growth; or

(5) The revision would result directly or indirectly in impairment of downstream uses.

§ 131.11 Analyses for changing or modifying uses.

(a) *Use Attainability Analysis.* A use attainability analysis should be sufficiently detailed to determine:

(1) The use to be protected.

(2) The extent to which pollution contributes to the impairment of the use versus other factors listed in § 131.10 and the improvement likely to occur in the absence of pollution;

(3) The extent to which control of pollution from point sources will restore or enhance the use, including plans to implement the controls;

(4) The extent to which the control of nonpoint source pollution will restore or enhance the use, including plans to implement feasible nonpoint source controls.

(b) *Benefit-Cost Assessment.* A benefit-cost assessment should:

(1) Identify the incremental benefits and costs of attaining a use, after meeting the technology-based requirements of the Act, to determine whether the benefits bear a reasonable relationship to the costs;

(2) Describe the value of the water body for a use including the social and economic value of the use, the public interest in establishing or maintaining the use, the public benefited, the extent to which another incompatible use is already being made of the water body, the availability of alternatives and the effect on downstream uses;

(3) Describe the significance of the benefits in comparison to the costs and economic impacts of attaining the use.

§ 131.12 Criteria.

(a) *Inclusion of pollutants*

(1) States must adopt water quality criteria that are compatible with protecting a designated use.

(2) Toxic Pollutants—States, with the assistance of EPA, are encouraged to review water quality data and information on discharges to identify specific water bodies where toxic pollutants may be adversely affecting the attainment of the designated water

use, and where appropriate to adopt criteria for such toxic pollutants applicable to the water body so as to protect the designated use.

(b) *Form of criteria:* In establishing criteria, States should:

(1) Establish numerical values based on:

(i) 304(a) Guidance; or

(ii) 304(a) Guidance modified to reflect site-specific conditions; or

(iii) Other scientifically defensible methods;

(2) Employ bioassay or biological criteria if appropriate; and

(3) Establish narrative descriptions where numerical values cannot be established or to supplement numerical values.

Note.—EPA recommends establishing numerical values wherever practical.

(c) *Determination of levels necessary to protect uses.*

(1) States shall adopt water quality criteria at levels that are adequate to support the designated uses. EPA shall review whether the criteria are appropriate to support the designated use(s). For waters with multiple use designations, the criteria shall support the most sensitive use

(2) States may select what they believe to be an appropriate risk level for pollutants identified as carcinogens and include in their water quality standards the ambient criteria associated with the particular risk level selected.

(3) States shall establish water quality criteria which protect downstream water uses (see § 131.10(i)(5)).

§ 131.13 General policies.

(a) In addition to the mandatory requirements of adopting uses and criteria, States may, at their discretion, adopt policies generally applicable to the State's water quality standards. States are encouraged to adopt the discretionary policies listed below but may also adopt other general policies.

(b) *Mixing Zones:* A limited mixing zone, serving as a zone of initial dilution in the immediate area of a point or nonpoint source of pollution, is allowed as a matter of State discretion. The mixing zone should be considered a place where wastes and water mix and not as a place effluents are treated. Mixing zones should not interfere with existing or designated uses of the segment. Water quality standards should describe the State's methodology for determining the location, size, shape, outfall design and in-zone quality of mixing zones, with sufficient precision to support such regulatory actions as issuance of permits and determination

of best management practices for nonpoint sources.

(c) Variances: States may grant variances to an individual discharger from compliance with a water quality criterion based on economic hardship, if:

- (1) The applicant demonstrates that meeting the criterion would cause substantial economic hardship (likely substantial loss of productivity, jobs, and/or financial stability), and
 - (2) The variance requirements are as close to the criterion as the applicant's financial situation will allow without substantial economic hardship, and
 - (3) The variance will not eliminate existing uses or preclude eventual attainment of the designated uses not currently being attained, and
 - (4) The variance does not exceed the time for which the discharger's NPDES permit is issued, and
 - (5) The variance does not exempt a discharger from compliance with other criteria in the water quality standards which are attainable, and
 - (6) The variance does not result in more stringent pollution control requirements for other parties.
- (d) Low flow exemptions: States may establish exemptions from compliance with water quality standards during critical low flow conditions.

Subpart C—Procedures for Review and Revision of Water Quality Standards

§ 131.20 State review and revision of water quality standards.

(a) *State Review:* States shall review and, as appropriate, revise their water quality standards at least once during each three year period beginning with the enactment of the Federal Water Pollution Control Amendments of 1972. States are not required to review or revise water quality standards for all water bodies in the State in any three year period to comply with the requirements of this regulation and Section 303(c)(1) of the Act. It is recommended that States select priority water bodies or segments for review. In selecting priorities, States should take into account the "Municipal Waste Water Treatment Construction Grant Amendments of 1981" (Pub. L. 97-117, December 29, 1981). Section 24 of the amendments is intended to ensure that water quality standards influencing construction grant decisions have been reviewed in accordance with Section 303(c) of the Act. It prohibits the award of a grant after December 29, 1984, unless the State has completed its review of the water quality standards for any segments affected by the grant project.

(b) *Public Participation:* The State shall provide for public participation in selecting priority areas and shall hold a public hearing for the purpose of reviewing water quality standards, in accordance with provisions of State law. EPA's water quality management regulation (40 CFR 130.3(b)(6)) and public participation regulation (40 CFR Part 25). The proposed water quality standards revision and supporting analyses shall be made available to the public prior to the hearing.

(c) *Submittal to EPA.* The State shall submit the results of the review, any supporting analysis for the use attainability analysis and benefit-cost assessment, if performed, the methodologies used for site-specific criteria development, any general policies applicable to water quality standards and any revisions of the standards to the Regional Administrator for review and approval, within 30 days of adoption of the revised standard, or if no revisions are made as a result of the review, within 30 days of the completion of the review.

§ 131.21 EPA review and approval of water quality standards.

(a) After the State submits its officially adopted revisions, the Regional Administrator shall either:

- (1) Notify the State within 60 days that the revisions are approved, or
- (2) Notify the State within 90 days that the revisions are disapproved. Such notification of disapproval shall specify the changes needed to assure compliance with the requirements of the Act and this regulation, and shall explain why the State standard is not in compliance with such requirements. Any new or revised State standard must be accompanied by some type of supporting analysis.

(b) The Regional Administrator's approval or disapproval of a State water quality standard shall be based on the requirements of the Act as described in Section 131.4.

(c) A State water quality standard remains in effect, even though disapproved by EPA, until the State revises it or EPA promulgates a rule that supersedes the State water quality standard.

(d) EPA shall, at least annually, publish in the *Federal Register* a notice of approvals under this section.

§ 131.22 EPA promulgation of water quality standards.

(a) If the State does not adopt the changes specified by the Regional Administrator within 90 days after notification of the Regional

Administrator's disapproval, the Administrator shall promptly publish such changes as a proposed regulation.

(b) The Administrator may also publish a proposed regulation, applicable to one or more States, setting forth a new or revised standard upon determining such a standard is necessary to meet the requirements of the Act.

(c) In promulgating water quality standards, the Administrator is subject to the same policies, procedures and analyses established for States in subpart B of these regulations.

APPENDIX B: CURRENT WATER-QUALITY STANDARDS REGULATION

The text on the following pages is from 40 C.F.R. §§35.1550 and 120.1-120.45 (1982). Although the proposed regulation removes §§120.37 and 120.45, the text for these sections (related to Nebraska and Ohio) was withdrawn previously [at 47 Fed. Reg. 32,128 (1982) and 47 Fed. Reg. 29,541 (1982)]. Therefore, those sections are not reproduced here.

§ 35.1550 Water quality standards.

(a) The State shall hold public hearings for the purpose of reviewing water quality standards and shall adopt revisions to water quality standards, as appropriate, at least once every three years and submit such revisions to the appropriate Regional Administrator pursuant to section 303(c) of the Act.

(b) The water quality standards of the State shall:

(1) Protect the public health or welfare, enhance the quality of water and serve the purposes of the Act;

(2) Specify appropriate water uses to be achieved and protected, taking into consideration the use and value of water for public water supplies, propagation of fish, shellfish, and wildlife, recreation purposes, and agricultural, industrial, and other purposes, and also taking into consideration their use and value for navigation; and

(3) Specify appropriate water quality criteria necessary to support those water uses designated pursuant to § 35.1550(b)(2).

(c) In reviewing and revising its water quality standards pursuant to § 35.1550(a), the State shall adhere to the following principles:

(1) The State shall establish water quality standards which will result in the achievement of the national water quality goal specified in section 101(a)(2) of the Act, wherever attainable. In determining whether such standards are attainable for any particular segment, the State should take into consideration environmental, technological, social, economic, and institutional factors.

(2) The State shall maintain those water uses which are currently being attained. Where existing water quality standards specify designated water uses less than those which are presently being achieved, the State shall upgrade its standards to reflect the uses actually being attained.

(3) At a minimum, the State shall maintain those water uses which are currently designated in water quality standards, effective as of the date of these regulations or as subsequently modified in accordance with § 35.1550(c) (1) and (2). The State may establish less restrictive uses than those contained in existing water quality standards, however, only where the State can demonstrate that:

(i) The existing designated use is not attainable because of natural background;

(ii) The existing designated use is not attainable because of irretrievable man-induced conditions; or

(iii) Application of effluent limitations for existing sources more stringent

than those required pursuant to section 301(b)(2) (A) and (B) of the Act in order to attain the existing designated use would result in substantial and widespread adverse economic and social impact.

(4) The State shall take into consideration the water quality standards of downstream waters and shall assure that its water quality standards provide for the attainment of the water quality standards of downstream waters.

(d) The Regional Administrator shall approve or disapprove any proposed revisions of water quality standards in accordance with the provisions of section 303(c)(2) of the Act.

(e) The State shall develop and adopt a statewide antidegradation policy and identify the methods for implementing such policy pursuant to this subpart. The antidegradation policy and implementation methods shall, at a minimum, be consistent with the following:

(1) Existing instream water uses shall be maintained and protected. No further water quality degradation which would interfere with or become injurious to existing instream water uses is allowable.

(2) Existing high quality waters which exceed those levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water shall be maintained and protected unless the State chooses, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, to allow lower water quality as a result of necessary and justifiable economic or social development. In no event, however, may degradation of water quality interfere with or become injurious to existing instream water uses. Additionally, no degradation shall be allowed in high quality waters which constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance. Further, the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and feasible management or regulatory programs pursuant to section 203 of the Act for nonpoint sources, both existing and proposed.

(3) In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with section 316 of the Act.

PART 120—WATER QUALITY STANDARDS

Sec.

- 120.1 Scope and purpose.
- 120.2 State adoption.
- 120.3 Availability.
- 120.10 Alabama.
- 120.12 Federally promulgated water quality standards for Arizona.
- 120.27 Kentucky. [Reserved]
- 120.34 Mississippi.
- 120.37 Nebraska.

Sec.

- 120.43 North Carolina. [Reserved]
- 120.45 Ohio water quality standards.

AUTHORITY: Sec. 1, 70 Stat. 506, as amended 33 U.S.C. 1160(c), unless otherwise noted.

SOURCE: 36 FR 22489, Nov. 25, 1971, unless otherwise noted.

§ 120.1 Scope and purpose.

This part applies to procedures for the adoption of water quality standards pursuant to section 10(c) of the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1160(c), hereinafter the Federal Act, and identifies and describes those State-adopted water quality standards which the Administrator of the Environmental Protection Agency, hereinafter the Administrator, has determined meet the criteria of the Federal Act.

§ 120.2 State adoption.

(a) Water quality standards consisting of water quality criteria and a plan for the enforcement and implementation of such criteria, if adopted by a State after notice and public hearing, and if determined by the Administrator to be such standards as will protect the public health or welfare, enhance the quality of water and serve the purposes of the Federal Act, shall thereafter be the water quality standards applicable to the interstate waters or portions thereof for which adopted.

(b) Determination by the Administrator that State-adopted water quality standards meet the criteria of paragraph (a) of this section shall be published in the FEDERAL REGISTER. Documents containing such standards shall be incorporated by reference into this part.

§ 120.3 Availability.

State-adopted water quality standards which the Administrator has determined meet the criteria of § 120.2 shall be available for inspection at the Regional Offices of the Environmental Protection Agency and at its Washington, D.C., address at Waterside Mall, Washington, D.C. 20460, where the official historic file of water quality standards shall be maintained.

§ 120.10 Alabama.

The beneficial uses identified in the water quality standards revisions adopted by the Alabama Water Im-

provement Commission on May 30, 1977, and revised on December 17, 1977, are amended as follows:

Basin	Stream	From	To	Classification
Coosa	Snow Creek	Choccolocco	Its source	Fish and Wildlife.
Lower Tombigbee	Sycamore Creek	Chickasaw Bogue	do	Do.
Tallapoosa	Christian Creek	Oaktasas Creek	do	Do.
	Dobbs Creek	do	do	Do.
	Parkerson Mill Creek	Chewacla Creek	do	Do.
Tennessee	Mud Creek	Cedar Creek	Town Branch	Do.
	Pond Creek	Tennessee River	Its source	Agnc. & Ind. Water Supply.
Tallapoosa	Calebee Creek	Highway 80	Persimmon Creek	Fish and Wildlife.
Tennessee	Piney Creek	County Road vicinity of Wooley Springs.	Its source	Do.
Warrior	Mill Creek	Chitwood Creek	do	Do.
	Indian Creek	Lost Creek	do	Do.
Choctawhatchee	Saver Creek	Newton Creek	do	Do.
Coosa	Walnut Creek	Hog Creek	do	Do.
Lower Tombigbee	Bassett's Creek	Orphan's Creek	do	Do.
	Wahalak Creek	Tishlarka Creek	do	Do.
Perdido Escambia	Indian Creek	County road crossing near Horn Hill.	do	Do.

[45 FR 9915, Feb. 14, 1980]

§ 120.12 Federally promulgated water quality standards for Arizona.

(a) Article 6, Part 2 is amended as follows:

(1) Reg. 6-2-6.11 shall read:

Reg. 6-2-6.11 Nutrient Standards. A. The mean annual total phosphate and mean annual total nitrate concentrations of the following waters shall not exceed the values given below nor shall the total phosphate or total nitrate concentrations of more than 10 percent of the samples in any year exceed the 90 percent values given below. Unless otherwise specified, indicated values also apply to tributaries to the named waters.

	Mean 90 pct annual value	
	Total phosphates as PO ₄ mg/l	Total nitrates as NO ₃ mg/l
1. Colorado River from Utah border to Willow Beach (main stem)	0.04-0.06	4-7
2. Colorado River from Willow Beach to Parker Dam (main stem)	0.06-0.10	5
3. Colorado River from Parker Dam to Imperial Dam (main stem)	0.08-0.12	5-7
4. Colorado River from Imperial Dam to Morelos Dam (main stem)	0.10-0.10	5-7

	Mean 90 pct annual value	
	Total phosphates as PO ₄ mg/l	Total nitrates as NO ₃ mg/l
5. Gila River from New Mexico border to San Carlos Reservoir (excluding San Carlos Reservoir)	0.50-0.80	
6. Gila River from San Carlos Reservoir to Ashurst Hayden Dam (including San Carlos Reservoir)	0.30-0.50	
7. San Pedro River	0.30-0.50	
8. Verde River (except Granite Creek)	0.20-0.30	
9. Salt River above Roosevelt Lake	0.20-0.30	
10. Santa Cruz River from international boundary near Nogales to Sahuarita	0.50-0.80	
11. Little Colorado River above Lyman Reservoir	0.30-0.50	

B. The above standards are intended to protect the beneficial uses of the named waters. Because regulation of nitrates and phosphates alone may not be adequate to protect waters from eutrophication, no substance shall be added to any surface water which produces aquatic growth to the extent that such growths create a public nuisance or interference with beneficial uses of the water defined and designated in Reg. 6-2-6.5.

(2) Reg. 6-2-6.10 Subparts A and B are amended to include Reg. 6-2-6.11 in series with Regs. 6-2-6.6, 6-2-6.7 and 6-2-6.8.

(Sec. 303, Federal Water Pollution Control Act, as amended, 33 U.S.C. 1313, 86 Stat. 816 et seq., Pub. L. 92-500)

[41 FR 25000, June 22, 1976; 41 FR 48737, Nov. 5, 1976. Redesignated and amended at 42 FR 56740, Oct. 28, 1977]

§ 120.27 Kentucky. [Reserved]

§ 120.34 Mississippi.

The water quality standards applicable to intrastate, interstate, and coastal waters of Mississippi, adopted by the Mississippi Air and Water Pollution Control Commission on April 12, 1977, are amended as follows:

Section III. Specific Water Quality Criteria.

1. Public water supply—*a*. Dissolved oxygen. Dissolved oxygen concentrations shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l in streams; shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l in estuaries and in the tidally affected portions of streams; and shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l in the epilimnion (i.e., the surface layer of lakes and impoundments that are thermally stratified, or 5 feet from the water's surface (mid-depth if the lake or impoundment is less than 10 feet deep at the point of sampling) for lakes and impoundments that are not stratified.

Epilimnion samples may be collected at the approximate mid-point of that zone (i.e., the mid point of the distance or if the epilimnion is more than 5 feet in depth, then at 5 feet from the water's surface).

2. Shellfish-harvesting areas—*a*. Dissolved oxygen. Dissolved oxygen concentrations shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l in streams; shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l in estuaries and in the tidally affected portions of streams; and shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l in the epilimnion (i.e., the surface layer of lakes and impoundments that are thermally stratified, or 5 feet from the water's surface (mid-depth if the lake or impoundment is less than 10 feet deep at

the point of sampling) for lakes and impoundments that are not stratified.

Epilimnion samples may be collected at the approximate mid-point of that zone (i.e., the mid point of the distance or if the epilimnion is more than 5 feet in depth, then at 5 feet from the water's surface).

3. Recreation—*a*. Dissolved oxygen. Dissolved oxygen concentrations shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l in streams; shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l in estuaries and in the tidally affected portions of streams; and shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l in the epilimnion (i.e., the surface layer of lakes and impoundments that are thermally stratified, or 5 feet from the water's surface (mid-depth if the lake or impoundment is less than 10 feet deep at the point of sampling) for lakes and impoundments that are not stratified.

Epilimnion samples may be collected at the approximate mid-point of that zone (i.e., the mid point of the distance or if the epilimnion is more than 5 feet in depth, then at 5 feet from the water's surface).

4. Fish and wildlife—*a*. Dissolved oxygen. Dissolved oxygen concentrations shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l in streams; shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l in estuaries and in the tidally affected portions of streams; and shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l in the epilimnion (i.e., the surface layer of lakes and impoundments that are thermally stratified, or 5 feet from the water's surface (mid-depth if the lake or impoundment is less than 10 feet deep at the point of sampling) for lakes and impoundments that are not stratified.

Epilimnion samples may be collected at the approximate mid-point of that zone (i.e., the mid point of the distance or if the epilimnion is more than 5 feet in depth, then at 5 feet from the water's surface).

(Sec. 303(c), Clean Water Act, as amended. (33 U.S.C. 1313(c))

[44 FR 25227, Apr. 30, 1979]

§ 120.37 Nebraska

(a) The water quality standards applicable to the surface waters of the State of Nebraska, adopted by the Nebraska Environmental Control Council

APPENDIX C: LIST OF FACILITIES

Table C.1 lists facilities that have water-quality-based limitations in their discharge permits or that have had their practices modified because of a concern for water quality.

Table C.1 Facilities with Water-Quality-Based Limitations

		Compared to technology-based requirements (BAT or NSPS), the water-quality-based limits in permit (or practices used) are ^b :			
Location	Facilities Identified ^a	No More Stringent	More Stringent	Difficult to Interpret	
Federal Region III					
District of Columbia	Potomac Electric Co. - Benning (1927-1972)	x			
West Virginia	Rehoboth Coal Co. - Randolph County Mine (?)	x			
	Enviro Energy - Mine No. One (?)	x			
	Quaker State Oil Refinery - St. Mary's (pre-1972)		x		
Federal Region IV					
Alabama	Alabama Electric Coop. - Unnamed plant, Choctow County (projected)				c
	Alabama Power - E.C. Gaston (1960-1974)				c

Table C.1 (Cont'd)

Location	Facilities Identified ^a	Compared to technology-based requirements (BAT or NSPS), the water-quality-based limits in permit (or practices used) are ^b :		
		No More Stringent	More Stringent	Difficult to Interpret
Florida	Florida Power Corp.			
	- Crystal River: Units 1-3 (1966-77)	x		
	Units 4-5 (projected)		x	
	- Anclote (1974-1978)	x		
	Florida Power and Light			
	- St. Lucie (1976)		x	
	Gulf Power Co.			
	- Crist (1945-1974)		x	
	Jacksonville Electric			
	- St. John's River Park (projected)		x	
	Key West Utilities			
	- Stock Island (1972)		x	
	Lakeland City			
	- Larsen (1950-1966)		x	
	- McIntosh (1970-1982)		x	
	Seminole Electric			
	- Seminole (?)		x	
	Tampa Electric			
	- Big Bend (1970-projected)	x		
	- Gannon (1957-1967)	x		
	Seminole Asphalt			
	- St. Marks (pre-1972)		x	
Kentucky	Big Rivers Electric Corp.			
	- D.B. Wilson (projected)		x	
	- Robert Reid (1966)	x		
	Cincinnati Gas and Electric			
	- East Bend (1981)		x	
	E. Kentucky Power Coop			
	- J.K. Smith (projected)		x	

Table C.1 (Cont'd)

		Compared to technology-based requirements (BAT or NSPS), the water-quality-based limits in permit (or practices used) are ^b :		
Location	Facilities Identified ^a	No More Stringent	More Stringent	Difficult to Interpret
Mississippi	Kentucky Utilities Co. - Ghent (1974-1981)		x	
	Louisville Gas and Electric - Trimble County (projected)		x	
	Mississippi Power Co. - Sweatt (1951-1952)		x	
	Tennessee Valley Authority - Yellow Creek (deferred)		x	
	Southland Oil - Crupp (pre-1972) inactive - Lumberton (pre-1972) - Sandersville (pre-1972)		x x x	
North Carolina	Carolina Power & Light - Mayo (projected) - Sutton (1954-1972)		x	x
	Duke Power Company - Belews Creek (1974-1975)			x
South Carolina	South Carolina Public Service Authority - Cross (projected) - Winyah (1975-1981)	x	x	
	Tennessee Valley Authority - Bull Run (1967) - Cumberland (1973) - Gallatin (1956-1959) - Johnsonville (1951-1959) - Kingston (1954-1955) - Phipps Bend (cancelled) - Sequoyah (1981-1982) - Sevier (1955-1957) - Watts Bend (projected)	x x x x x x x x x	x x x x	

Table C.1 (Cont'd)

		Compared to technology-based requirements (BAT or NSPS), the water-quality-based limits in permit (or practices used) are ^b :		
Location	Facilities Identified ^a	No More Stringent	More Stringent	Difficult to Interpret
Federal Region V	U.S. Dept. of Energy - Clinch River (projected)		x	
	Illinois			
	Central Illinois Light - E.D. Edwards (1960-1972)		x	
	Illinois Power Co. - Baldwin (1970-1975) - Coffeen (1965-1972)	x	x	
	Marathon Oil - Robinson (pre-1972)		x	
	Mobil Oil - Joliet (post 1972)		x	
	Shell Oil Co. - Wood River (pre-1972)	x		
	Texaco - Lawrenceville (pre-1972)		x	
Indiana	Energy Cooperative, Inc. - East Chicago (pre-1972)		x	
	Laketon Asphalt & Refining Co. - Laketon (pre-1972)		x	
Minnesota	Erie Mining Co. (?) - Taconite Harbor		x	
Wisconsin	Dairyland Power Coop. - Genoa (1941-1969)	x		
	Lake Superior Dist. Power - Bay Front (1917-1957)	x		

Table C.1 (Cont'd)

		Compared to technology-based requirements (BAT or NSPS), the water-quality-based limits in permit (or practices used) are ^b :		
Location	Facilities Identified ^a	No More Stringent	More Stringent	Difficult to Interpret
	Wisconsin Electric Power Co.			
	- Commerce (1941)	x		
	- E. Wells (1939)	x		
	- Lakeside (1920-1930)	x		
	- Oak Creek (1953-1967)	x		
	- Port Washington (1935-1969)	x		
	- Valley (1968-1969)	x		
	Wisconsin Power & Light			
	- Blackhawk (1947-1949)	x		
	- Rock River (1954-1955)	x		
	Wisconsin Public Service			
	- Pulliam (1927-1964)	x		
	- Weston No. 1 & 2 (1954-1960)	x		
	Murphy Oil Corp.			
	- Superior (pre-1972)		x	
Federal Region VI				
Arkansas				
	Southwestern Electric Power Co.			
	- Flint Creek		x	
Louisiana				
	CPI Oil & Refinery, Inc.			
	- Lake Charles (post-1972)		x	
	Cities Service Co.			
	- Lake Charles (pre-1972)		x	
	Conoco, Inc.			
	- Lake Charles (post-1972)		x	
	Lake Charles Refining Co.			
	- Lake Charles (post-1972)		x	
	Mallard Resource Co.			
	- Gueydon (post-1972)		x	
	Shepard Oil Inc.			
	- Mermentau (post-1972) idle		x	

Table C.1 (Cont'd)

		Compared to technology-based requirements (BAT or NSPS), the water-quality-based limits in permit (or practices used) are ^b :		
Location	Facilities Identified ^a	No More Stringent	More Stringent	Difficult to Interpret
New Mexico	South Louisiana Production - Mermentau (post-1972)		x	
	T&S Refining Inc. - Jennings (post-1972)		x	
	Public Service Co. of New Mexico - San Juan (1976-1979)		x	
Texas	Charter International Oil Co. - Houston (pre-1972)		x	
	Exxon Co. U.S.A. - Baytown (pre-1972)		x	
Federal Region VIII				
Colorado	City of Colorado Springs - Martin Drake (1925-1974)		x	
	- R.D. Nixon (1940)		x	
	Colorado-Ute Electric - Craig (1979-1980)		x	
	- Hayden (1965-1979)		x	
	Public Service Co. of Colorado - Arapahoe (1950-1955)		x	
	- Cherokee (1957-1968)		x	
	- Zuni (1948-1954)		x	
	Empire Energy - Routt Co. Coal Mine (?)			x
	Asamera Oil Co. - Commerce City (?)			x
	Conoco - Commerce City (?)			x

Table C.1 (Cont'd)

		Compared to technology-based requirements (BAT or NSPS), the water-quality-based limits in permit (or practices used) are ^b :		
Location	Facilities Identified ^a	No More Stringent	More Stringent	Difficult to Interpret
Montana	Montana-Dakota Utilities - Lewis & Clark (1958)	x		
	Montana Power - Corette (1968)	x		
	Flying J. Inc. - Cut Bank (pre-1972)		x	
South Dakota	Black Hills Power & Light - Ben French (1961) - Kirk (1935-1956)		x x	
Utah	Utah Power & Light - Carbon (1954-1957)	x		
	All mines with permits (35)	x		
Wyoming	Basin Electric Power Co. - Laramie River (1980)		x	
	Pacific Power & Light - Jim Bridger (1974-1979) - Wyodak (1978)		x x	
Federal Region IX				
California	Pacific Gas & Electric - Hunter's Point (1948-1958) - Oleum (1942-1943) - Pittsburgh (1954-1972) - Portrero (1931-1965)	x x x x		
	Southern California Edison - Cool Water (1961-1964)		x	
	All power plants discharging to ocean (14)	x		

Table C.1 (Cont'd)

Location	Facilities Identified ^a	Compared to technology-based requirements (BAT or NSPS), the water-quality-based limits in permit (or practices used) are ^b :		
		No More Stringent	More Stringent	Difficult to Interpret
Nevada	Nevada Power Co.			
	- Clark (1959-1961)		x	
	- Sunrise (1964)		x	
	Sierra Pacific Power Co.			
	- North Valmy (1981)		x	
	Southern California Edison			
	- Mohave (1971)		x	

^aNumbers in parentheses indicate the date that facility began operation. A range of dates means that a facility had a number of units coming on line during the period shown. No facilities were identified in Federal Regions I, II, VII, and X.

^bIn deciding whether or not the water quality-bound limits are more stringent, a judgment was made as to whether treatment provided by a typical facility meeting BAT or NSPS requirements is adequate to meet such limits.

^cDischarge rerouted to a larger stream.

Source: Davis, M.J., Argonne National Laboratory, unpublished data (1983).

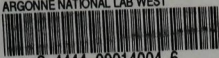
Estimated to be the same as the value in the preceding row (if not stated otherwise)

Country	Year	Value	Unit
Algeria	1970	1.0	1000 tons
Algeria	1971	1.0	1000 tons
Algeria	1972	1.0	1000 tons
Algeria	1973	1.0	1000 tons
Algeria	1974	1.0	1000 tons
Algeria	1975	1.0	1000 tons
Algeria	1976	1.0	1000 tons
Algeria	1977	1.0	1000 tons
Algeria	1978	1.0	1000 tons
Algeria	1979	1.0	1000 tons
Algeria	1980	1.0	1000 tons
Algeria	1981	1.0	1000 tons
Algeria	1982	1.0	1000 tons
Algeria	1983	1.0	1000 tons
Algeria	1984	1.0	1000 tons
Algeria	1985	1.0	1000 tons
Algeria	1986	1.0	1000 tons
Algeria	1987	1.0	1000 tons
Algeria	1988	1.0	1000 tons
Algeria	1989	1.0	1000 tons
Algeria	1990	1.0	1000 tons
Algeria	1991	1.0	1000 tons
Algeria	1992	1.0	1000 tons
Algeria	1993	1.0	1000 tons
Algeria	1994	1.0	1000 tons
Algeria	1995	1.0	1000 tons
Algeria	1996	1.0	1000 tons
Algeria	1997	1.0	1000 tons
Algeria	1998	1.0	1000 tons
Algeria	1999	1.0	1000 tons
Algeria	2000	1.0	1000 tons
Algeria	2001	1.0	1000 tons
Algeria	2002	1.0	1000 tons
Algeria	2003	1.0	1000 tons
Algeria	2004	1.0	1000 tons
Algeria	2005	1.0	1000 tons
Algeria	2006	1.0	1000 tons
Algeria	2007	1.0	1000 tons
Algeria	2008	1.0	1000 tons
Algeria	2009	1.0	1000 tons
Algeria	2010	1.0	1000 tons
Algeria	2011	1.0	1000 tons
Algeria	2012	1.0	1000 tons
Algeria	2013	1.0	1000 tons
Algeria	2014	1.0	1000 tons
Algeria	2015	1.0	1000 tons
Algeria	2016	1.0	1000 tons
Algeria	2017	1.0	1000 tons
Algeria	2018	1.0	1000 tons
Algeria	2019	1.0	1000 tons
Algeria	2020	1.0	1000 tons
Algeria	2021	1.0	1000 tons
Algeria	2022	1.0	1000 tons
Algeria	2023	1.0	1000 tons
Algeria	2024	1.0	1000 tons
Algeria	2025	1.0	1000 tons
Algeria	2026	1.0	1000 tons
Algeria	2027	1.0	1000 tons
Algeria	2028	1.0	1000 tons
Algeria	2029	1.0	1000 tons
Algeria	2030	1.0	1000 tons

The data in this table are based on the most recent available information. The data for 2020 and 2021 are preliminary estimates. The data for 2022 and 2023 are preliminary estimates. The data for 2024 and 2025 are preliminary estimates. The data for 2026 and 2027 are preliminary estimates. The data for 2028 and 2029 are preliminary estimates. The data for 2030 are preliminary estimates.

Source: World Bank, World Development Indicators, unpublished data (2023).

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